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"WELL, Joe," said the General Manager to his master mechanic as they were leaving the terminal on their arrival home from the A. E. R. A. Convention, "the Convention seems to grow in popularity and value each year. A number of the papers read were fine, particularly those on train operation. From what I heard about the success of train operation on the Public Service Railway of New Jersey, I am satisfied that for our city service Westinghouse Light Weight HL Control is just what we want. What do you think?"

"Boss," answered Joe, "I firmly believe that if every road now using HL Control and Westinghouse Commutating Pole Motors made public their operating results, that every new installation would be 'Westinghouse Electric.'"

Westinghouse Electric & Manufacturing Company

Sales Offices in 45 American Cities **East Pittsburgh, Pa.**

Electric Railway Journal

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SCHEMATIC DIAGRAMS ON WIRING PLANS

The value of single-line wiring diagrams in the interpretation of detailed connection drawings has become widely realized within the past few years, and the development of high-tension transmission systems and apparatus of the polyphase type has been largely responsible for this. Of late the usefulness of the schematic diagram has been still further increased by placing it on the same tracing as the important detailed drawing necessary to the construction man's work, and when the convenience of this practice is more generally recognized, there is little doubt that it will become a standard procedure. An interurban railway company in the East which is developing its power system along comprehensive lines applied the schematic idea in one corner of a number of complex wiring plans, with the result that its officials saved much valuable time in working with the latter. There was no "lost effort" in trying to grasp quickly the relations of different details. On many wiring plans such condensation is, of course, unnecessary, but whether the space available is large or small, the usefulness of single-line or skeleton diagrams is of the utmost value, not only to the busy executive but to the new man in the plant who in the company's best interests needs to be taught the apparatus relations in the shortest feasible time.

COURTS AND THE SMOKE NUISANCE

Engineers and boards of directors may hold back, but the courts are ready for the electrification of steam lines, in cities at least. Judges do not have to raise capital; they simply decide what we must do and leave the financing to others. Nevertheless, much significance is to be attached to the decision just rendered by the Supreme Court of Pennsylvania to the effect that the Reading Railroad must pay for locomotive smoke damage to property along the line of its new elevation through Philadelphia. For the court reaches its decision on reasoning to the effect that as electrical operation is feasible, the railroad company may be penalized for failure to adopt this method of conducting transportation through closely built-up areas. This is a complete reversal of precedents that have been maintained by the Pennsylvania courts ever since the "Filbert Street cases" of a generation ago were decided in favor of the Pennsylvania Railroad. In those cases the courts held that the company was not liable for smoke damages, because the creation of a certain amount of smoke was an unavoidable incident of the lawful business of conducting a railroad. Now the Supreme Court of the State where this precedent was laid down declares that the old rule should no longer prevail, since electrification is a demonstrated means of avoiding smoke damage. Smoke, the court says, in effect, is not now, as it was formerly, unavoidable, and, this being so, property owners now have grounds for the recovery of damages sustained as a result of steam locomotive operation. The pressure from all quarters for urban electrification at least has been bearing heavily on the railroads in many quarters. The Pennsylvania decision, if generally followed, would make it all the more necessary that the money for electrifying steam lines should be found with the least possible delay.

TWO-CAR TRAIN TESTS IN NEWARK

It is very satisfactory to learn that the Public Service Railway, of New Jersey, is planning to conduct another series of tests of two-car train operation to determine more definitely the relative advantages of this method of operation and of single cars. We do not know of any matter of more vital importance than this to operators of properties in large cities, and the interest which this subject naturally excites as a possible means of reducing rush-hour congestion has been enhanced by the able reports presented during the past two years by the joint committees of the Transportation and Engineering Associations on city and interurban train operation. These reports analyzed the situation thoroughly from a technical and financial standpoint and gave the fundamental data which every company needs in its consideration of the subject. As stated elsewhere in this issue, the new tests which the Public Service Railway will conduct are planned so as to overcome the main condition which was found, in the original tests, to introduce confusion in the final results. This was the lack of familiarity with train operation on the part of the crews and the public. The result was that the greater elapsed time for stops required by the two-car train so reduced the advantage gained by its use as to leave very

much in doubt the final question of superiority between the two methods. Undoubtedly a point exists where a slower schedule on the part of a two-car train will just balance in cost of operation its gain from a reduction in platform expenses. Under the conditions existing in Newark the percentage of reduction in speed of the train to bring this about has been estimated by the engineers of the Public Service Railway to be about 4 per cent. With a reduction less than this, the two-car train, other conditions being equal, would be superior, and it is the question of the extent, if any, to which train operation will reduce the schedule speed under Newark conditions that is to be determined. The industry is to be congratulated upon the enterprise of the Public Service Railway in thus continuing these tests, and we are sure that all of our readers who are engaged in transportation service in large cities will be greatly interested in the outcome of these trials.

THE CLEVELAND FRANCHISE IS NOT A SOLUTION

Disregarding the loss in capital value inflicted on stockholders by the Cleveland Railway franchise, the main question of concern about that ordinance is: Has it satisfactorily solved the street railway problem? Mr. Duffy, whose membership on the recent board of arbitration gave him an excellent opportunity to study the actual workings of the ordinance, told the American Electric Railway Association in his paper at Atlantic City last week in effect that it had not solved the problem satisfactorily for either the public or the company.

It is natural that stockholders who suffered heavy loss through the ordinance provisions should feel that the agreement is woefully lacking in justice and fairness. It is natural also that city officials of Cleveland should do what they have done in rushing to the defense of the agreement as soon as the conclusions reached by Mr. Duffy came to their attention.

The reasons given by Mr. Duffy for his conclusions may be summarized as follows: The service is inadequate and unsatisfactory. The cost of operation is greater than the revenue, provided proper allowances are made for reserves for those elements of cost which are not represented by current outlays. The capital value is reduced. The rate of return and margin of safety are insufficient. There is no assurance that the capital value allowed will be unimpaired. The apparent provision for depreciation is open to the same criticism as the thoroughly discredited rate methods of assessment life insurance organizations. The difficulties and political conditions hampering the practical administration of the ordinance will be appreciated at some time by junior security holders, with resultant effect on credit sources.

The criticism of the service made by Mr. Duffy is more than a mere observation based on the number of cars on the streets; he calls attention to the limited trackage operated from the standpoint of population and territory served. No doubt two factors are responsible for the comparative deficiency of Cleveland in the respect thus outlined. One is that during the long period of bitter contest which preceded the adoption of the present franchise the property was in such peril from the attacks of city officials that the normal increase in trackage was not built. Certainly there was no encouragement to build it; there was enough discouragement in the outlook to make the company fearful for what it had and to keep it from risking more. Another factor is the necessity which the city officials are under of avoiding the construction of any material amount of mileage that will not pay its way from the start. If the low fare is to be retained, the returns cannot be diluted by the construction of outlying extensions which would involve a long haul and light density of traffic.

The reserves which Mr. Duffy mentioned as being excluded from the cost of operation were considered in part by the board of arbitration, whose decision was published in the Electric Railway Journal for June 28, 1913. The clear intent of the ordinance was to safeguard the capital investment at the point to which it had been reduced, and that purpose is not carried out if definite provisions are not made for proper reserves. The Cleveland ordinance was meant to be singularly purposeful in providing for street railway fares at cost consistent with the security of the property and the certainty of a fixed return thereon. Unfortunately, some public utility companies have been at fault in contending in one case that no depreciation existed when it should have been taken into account and in arguing in another case, where their interests were affected in an opposite way, that depreciation existed though invisible to the naked eye, and therefore that provision should be made for it. But the fact that mistakes have been made in many cases in the past is no reason why the city of Cleveland should insist upon a wrong principle at this time. The ordinance explicitly provides for a maintenance, depreciation and renewal account, and even if a provision for the care of depreciation which is not made good through current expenses would increase the rate of fare in Cleveland, the provision ought to be made.

Another point which Mr. Duffy mentioned is the insufficiency of the present rate of return. If there were ever reasons why the company should be protected amply with a wide margin of earnings above the necessary interest and dividend requirements, these reasons have gained twofold in importance through the changes in the money market since the passage of the ordinance. By reason of these changes the company and its security holders are the victims of circumstances for which, of course, the city cannot be held responsible in any degree. Six per cent was a more inviting rate a few years ago than it is now. Perhaps the pendulum will swing backward again, but if it does not, the company will be hampered in its financing in the future by comparison with other companies which can meet shifting conditions by changing the rates of return which they have to pay for capital as the necessities of the moment require. Hence the city should allow a safe margin above the ordinance rates.

The most serious indictment made by Mr. Duffy is that the ordinance fails to convey any assurance that the capital value will be unimpaired at the expiration of the grant. We believe that the clear purpose of the city was that there should be no question of the complete integrity of the principal value of the securities left to the company after the scaling process was finished. The city is morally bound to protect the company in this manner; it ought to want to be legally bound to do so.

The real difficulty with the Cleveland situation is that in the changing political conditions of the times some of the basic elements of the intent of the ordinance have been lost to sight. The intent was that fares should be at cost, that the capital value should be protected and that a fair return should be afforded. In the shifting kaleidoscope of time the city officials of Cleveland appear to think that the one definite motive of the ordinance was to provide 3-cent fares and that all other provisions must be interpreted, distorted, shaped or changed to secure that end. As a matter of fact, flexibility was made possible in the rate of fare just as much as in the maintenance and other operating expense charges, because by that means only could the virtue of the arrangement be assured.

MR. DALRYMPLE'S INTERVIEW

It was a Scotchman named Burns who wished for the gift "to see ourselves as others see us," and now another Scot, yielding to our request to let us enjoy the same privilege, has consented to give his impressions of American street railways. We feel that all of our readers will be interested to read what Mr. Dalrymple says in another column about our track, shops and cars, about our methods of prepayment operation, about our problems of congestion and overcrowding, and on the subject of public relations. In making his comparisons, Mr. Dalrymple freely admits the influence of local conditions in a great many features in which there is a difference in British and American operating practice. Thus, in discussing overcrowding, he says that while overcrowding is less abroad during the rush hours than here, the riding at other times is better distributed. For this reason, in Europe, much of the traffic is taken out of the way before the rush hour begins. We assume, also, that still another reason for the higher traffic peak here is the difference, in characteristic design, of the American city as compared with that in Great Britain. In all European countries, as a rule, the business district of a city is spread out, owing to the restrictions on the erection of high buildings and the smaller number of very large shops or department stores. On the other hand, the residential area, compared with that in the average American city, is much more compact, owing, undoubtedly, in part to the zone system of street railway fares in force and the restricted development of suburban lines. In consequence, the rush-hour traffic in the average American city is largely in the form of long riding from a single center, and in Great Britain in the form of short riding from a number of local centers.

The portion of Mr. Dalrymple's remarks which will attract the greatest interest, however, will be that relating to municipal ownership. The critical situation in several prominent cities in this country has evidently made a deep impression upon him, and he said that in the end, in his opinion, the municipalities will take over the railway properties. Such a step, we assume, Mr. Dalrymple would regard as involving very great dangers to the public unless there should be a radical change in the methods employed in carrying on municipal work in the United States. We are led to this conclusion because Mr. Dalrymple in continuation said that unless the executive officials of the railway properties have security in office and changes of administration have no effect on the operation or the personnel of the street railway, the result will be confusion—and, he might have added, financial disaster as well. Testimony of this kind and from this source is of the highest value. In other words, unless the American methods of municipal politics can be made over and the spoils system be banished, a municipality should not assume the great responsibility involved in the direction and operation of its local transportation systems.

It is a common principle of business that unless a man shows himself capable of administering with some degree of efficiency the simple undertakings which may be assigned to him, he should not be placed in charge of larger enterprises. This principle underlies the reasons of thoughtful citizens against the municipal operation of electric railways in this country.

ENFORCEMENT OF INTERURBAN RULES

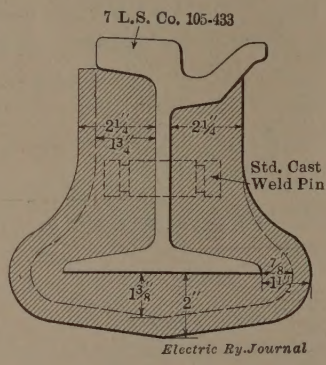
In its verdict on the late disaster on the San Francisco, Napa & Calistoga Railway the California Railroad Commission said: "Only slight changes in rules are ordinarily necessary, but much improvement is necessary in the manner in which the established rules and regulations are complied with. In the case of the wreck in question, the real cause was not the failure to adopt rules but the failure to require compliance with the existing rules." This latter condition the commission lays directly at the door of the officials of the company. Whatever may be the facts in this particular case, the criticism that commendable rules are found to be in print but are accompanied by lax conditions of enforcement has been made before in regard to both steam and electric lines, and many disasters have been attributed to this cause. The basic trouble is that a great many people believe in the discharge or punishment of employees where the violation of rules results in disaster but in individual cases will criticise a management as unnecessarily severe unless it retains in the service those whose violations result in no loss of property or life. It is often true that a gradation of punishment is advisable according to the circumstances, but where rules exist and are broken officials should undoubtedly see that the violators suffer the consequences.

In the case in point the California Railroad Commission states that most of the interurban lines in that State should be protected by block signals. This is important not only from the standpoint of the safety of the public but also from that of the accompanying assurance given the companies that the commission realizes the expense which such an order entails. Then this definite statement is made: "If the installation of the necessary safety devices requires an increase in the rates of the utilities, such an increase will be allowed. The traveling public has a right to be protected and should be willing to pay for such protection." In case any utility exists in California whose failure to provide properly for the safety of the public is based on inadequate rates, it now has no reason for a failure to install proper devices. The decision of the commission as regards the installation of safety devices and the enforcement of existing rules certainly puts the matter up to officials of electric interurban railways in that State.

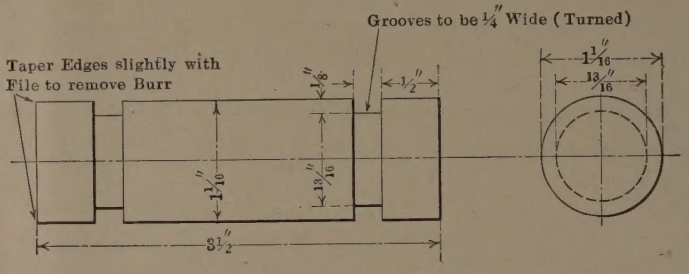
Cast-Weld Joints and Steel Ties in Brooklyn

The Following Paragraphs Describe the Latest Cast-Weld Rail Joint Practice for Curves and Tangents and Some Experimental Steel Tie Construction of the Brooklyn Rapid Transit System

During the years 1908 to 1911 the Brooklyn Rapid Transit System installed several thousand riveted joints with eight rivets per side in 7/8-in. x 3½-in. x 29½-in. inside plates and 7/8-in. x 4½-in. x 29½-in. outside plates for 7-in. rail; also in 5/8-in. x 5¾-in. x 30½-in. inside and outside plates for 9-in. rail. This form of joint was installed on both new and old track, but after it had been under traffic for about two years it was found that many rivets had loosened through tendency to shear under impact. After careful consideration the company decided, in 1911, to install in new construction the cast-weld joint hereinafter described. By Sept. 30, 1913, 2600 of these new joints had been put in place. These are in use on fourteen important lines in various parts of Brooklyn and hence are subject to a great variety of conditions. The new joint has given very little trouble, as will be noted from the following record of installations and the constantly decreasing proportion of failures:



Brooklyn Joints and Ties—Cross-Section at Weld

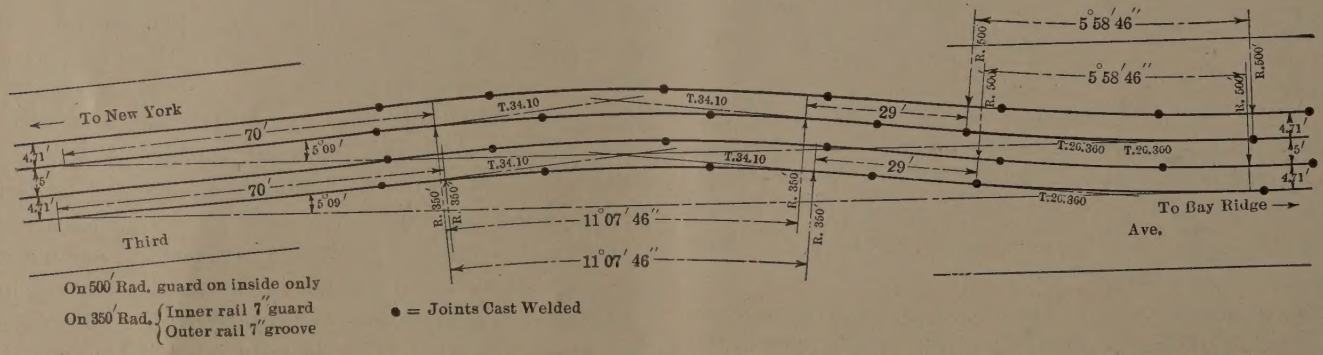


Brooklyn Joints and Ties—Steel Pin Used in Weld as Mechanical Tie and for Distributing Tension Strains

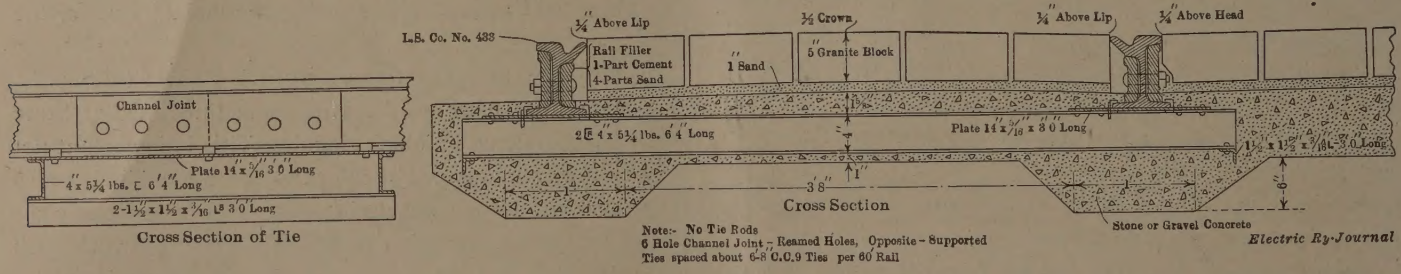
instead of a wagon, a plan which secures better positive and negative contacts for the cupola blower and also permits the car to be located so close to the work that the molten metal loses little heat before it is poured.

PROCESS OF INSTALLATION

The Brooklyn method of installing the cast-weld joint is well shown in the accompanying series of halftone engravings. First two holes are drilled in the end of each abutting rail to the standard single row spacing of 2½ in. and 4 in., after which the track is lined through by the temporary application of standard joint plates with two bolts per joint. The next step is to remove the plates and apply a sand blast until a satisfactory surface has been obtained.


To New York
To Bay Ridge
Third Ave.
On 500' Rad. guard on inside only
On 350' Rad. Inner rail 7" guard
Outer rail 7" groove
● = Joints Cast Welded

Brooklyn Joints and Ties—Distribution of Cast-Weld Joints on Inner and Outer Arcs of Reverse Curve


Cross Section of Tie
Cross Section
Note:- No Tie Rods
6 Hole Channel Joint - Reamed Holes, Opposite - Supported
Ties spaced about 6-8 C.C. 9 Ties per 60' Rail
Stone or Gravel Concrete
Electric Ry. Journal

Brooklyn Joints and Ties—Cross-Section of Track Construction Using Steel Ties with Intermediate Plates for Rail Connection

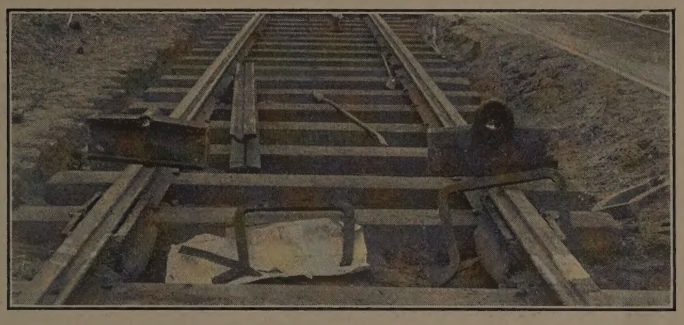
CAST-WELD JOINT INSTALLATIONS AND FAILURES

Joints installed 1911	388
Failures 1911-1912	23
Failures 1912-1913	8
Net number of good joints	357
Joints installed 1912	1084
Failures 1912-1913	9
Net number of good joints	1075
Joints installed to Sept. 30, 1913	1500
Failures	0

The reduction and practical elimination of joint failures are ascribed to two causes. One is experience in the casting of these joints. The other is the use of a cupola car

Steel pins are then inserted in the two holes nearest the ends of the rails. These pins are made of cold-rolled steel and are about 3½ in. long by 1 1/16 in. diameter with a ¼-in. groove near either end, as shown in one of the accompanying drawings. They are used to assist in distributing tension strains throughout the metal of the weld, the groove having been added in the Brooklyn design to give a better bond with the metal. They also serve to unite mechanically the two halves of the joint casting. The molds which are now put in place consist of a right-hand

and left-hand piece, for the sides of the rail, and a top piece which fits the head of the rail. First the molds are thoroughly dried, and their inner surface is oiled before setting. The side pieces are then secured by means of an inverted C-shaped clamp. This type of clamp has replaced the scissors design illustrated in one detail view on this page because the latter extended over the head of the rail and so prevented car operation.



Brooklyn Joints and Ties—Side Pieces of Mold Free and Set; Temporary Clamps of Scissors Type

Brooklyn Joints and Ties—The Mold Complete and Ready for Pouring; Inverted C Clamps Used

As soon as the side pieces have been clamped in position, all cracks and seams are filled with fire clay. The mold is completed by setting the top piece and keeping it in position by means of the clamp bar and screw illustrated on this page. This bar is provided with clamps which hook under the rail from opposite sides, while the screw is turned by means of a hole in its head. The top piece contains the riser hole. Its principal functions are to hold the head of the rail in surface, to prevent the cambering of the joint and help to dissipate heat. The mold is made ready for pouring by having sand or earth banked around it, as shown on this page. To prevent foreign substances from getting into the mold before the pouring, properly weighted pieces of paper are put over the riser hole until the metal is brought to it. When more than twenty-four joints are to be poured the top pieces of the molds on the middle section of the work are omitted to permit the movement of the cupola car.

The pouring of the ladle and a filled riser hole are illustrated on page 922. It will be noted that a pair of special

Brooklyn Joints and Ties—Sand Blasting the Rail Before Placing the Mold

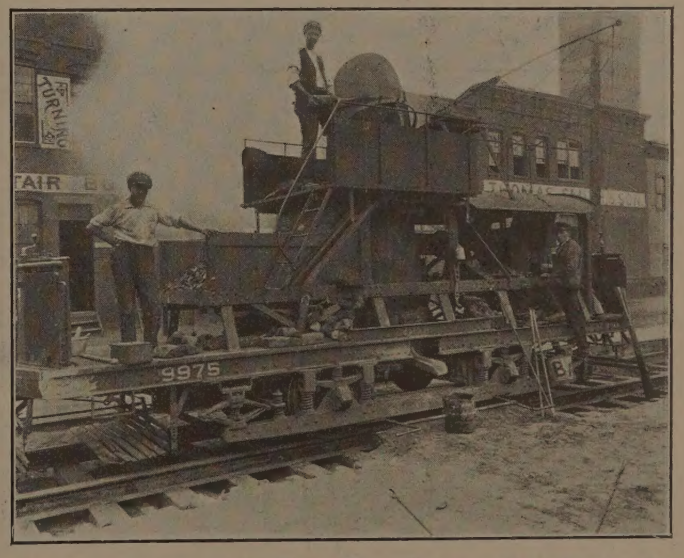
posts with lugs to support the ladle handles are used so that the metal can be poured gradually and correctly. The top clamps are allowed to remain in place for about two hours to permit proper cooling. The joint is completed by being filed with a hand-operated reciprocating file.

When cast welding was inaugurated the cupola equipment was mounted on a wagon. This wagon usually had to remain in a side street, so that some trouble was experienced from the chilling of the metal when carried for an appreciable distance. These difficulties have been overcome by placing the equipment on a car which is moved up to the work as closely as possible. Under these conditions the maximum distance of carrying the ladle is usually not more than 300 ft. The fire is prepared at the yard of the way department in the morning so that when work begins at the job the metal will be ready to pour in about ten minutes after the blast has been started. In another ten minutes the color of the metal changes from yellow to the desired whiteness.

All welding is done during the day, and the average number of joints made varies from twenty-four to thirty, with a maximum of thirty-eight. As many as twenty-six joints have been poured in one hour. The work of setting the molds begins at 9 a.m., and the last pour is made about 1 o'clock, so that the tracks are ready for rush-hour service by 4 p.m. The gang trained for cast welding is composed of full-time employees who are available for other work at other hours.

CONDUCTIVITY, PREVENTION OF HUMPING, ETC.

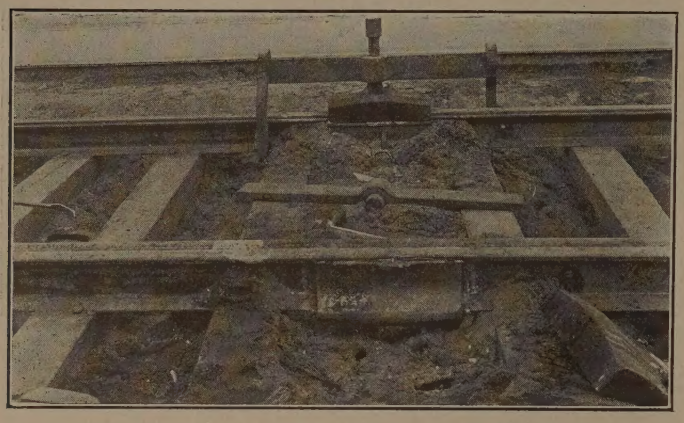
Tests of the new joint have shown that its conductivity is equal to 3.37 ft. of rail, so that it is practically the equivalent of the 7-in. rail section. The cast-weld joints are now



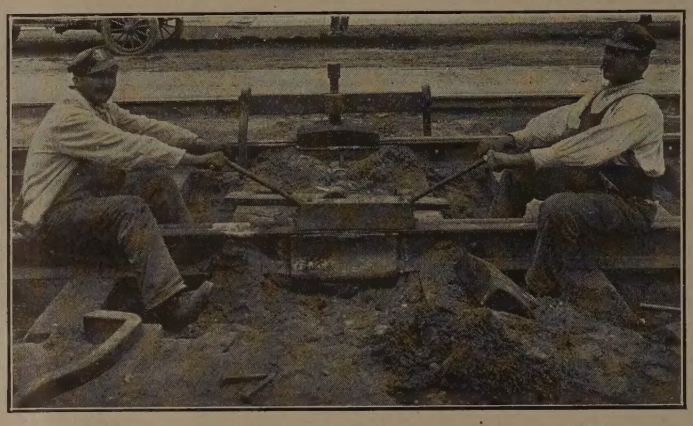
Brooklyn Joints and Ties—The Cupola Car Ready for Service

placed opposite instead of staggered. Hence if any humping does occur it will be confined to fewer spots. However, this humping has been practically eliminated since closer attention has been given to weather conditions during welding and the top clamps have been tightened to the limit. As regards weather conditions, it was observed that in cool weather, with the joint between the old and new rail open, the welding of the first joints in a section of track closed

up the gap at the ends only temporarily, for as soon as the earlier welds had cooled the rail would contract again. Consequently, the last joint poured was not likely to induce enough expansion to fill permanently the gap between the old and new rail. In uniformly cool weather, therefore, the wedges which are placed between the old and new rail remain in position throughout the operations, but in hot weather, with rising temperatures, the end joints are permitted to stay open and so allow the rail to be free. Objection has been raised on theoretical grounds to the tightening of the top clamp because of the assumed extra strain upon the casting. Practical experience has demonstrated, however, that the top clamp does not throw the joint out of level.



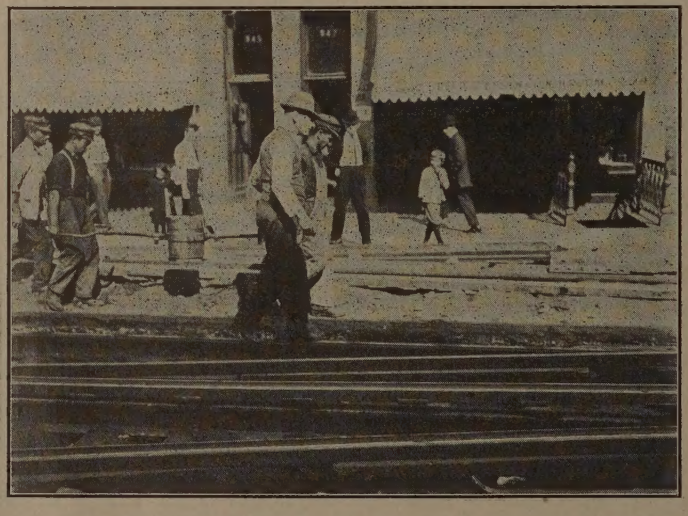
Brooklyn Joints and Ties—Poured Molds With and Without the Clamping Outfit



Brooklyn Joints and Ties—Filing Down the Poured Joint for the Finish

While no attempt is made to pour welds in heavy showers, it has been found that if the molds are well prepared and kept dry and also if water is prevented from filling the groove of the rail, welds can be poured in light rains without any damage to the casting or injury to the operators because of blowing. The use of a cupola car instead of a wagon, as previously noted, has made it possible to cut down the carrying distance of ladles from 800 ft. to a maximum of say 300 ft. After the company's experience with cold metal in 1911, it was intended to use thermit for reheating the metal in the ladles just before pouring, but the introduction of the car made this precaution unnecessary.

Brooklyn Joints and Ties—Pouring Cast-Weld Joint Alongside the Cupola Car



Brooklyn Joints and Ties—Carrying the Ladle to Cast-Weld on Curves

CAST-WELD JOINTS ON CURVES

A most striking application of the cast-weld joint has been made this year to curves of any radius from 125 ft. upward. The early experiments showed that if the welds were made in serial order from either end of the curve each weld in turn would cause a kinking of the portion of rail ahead. This difficulty has been overcome by welding the first joint at that part of the curve which is most liable to kink, namely, the center. The following joints are then poured alternately on opposite sides of the first weld. In this manner the kinking effect on opposite sides is neutralized. The welding is always begun on the inner arcs, inasmuch as the shorter pieces are those most likely to give trouble. The plan on page 920 illustrates how such joints were installed on a reverse curve. The joints on the guard rail were 30 ft. apart and on the outer rail 60 ft. apart. Where joints are made in open track on tangents, expansion joints 1000 ft. apart are used, but they are not installed on curves, as the curves themselves tend to act like expansion joints. The total number of cast-weld joints on curves installed this year by the Brooklyn Rapid Transit Company was approximately 200.

RECORDS

One of the most important features of the cast-weld joint installation is that a record is kept of the conditions under which each joint is poured, of the interval which elapses between the pouring of the last joint and the resumption of car service and of any special phenomena at the pouring of the joint, such as boiling or blowing. Thus, if a joint should break, the record is available so that a correct diagnosis can be made of the cause. A typical report on a joint which had been found broken follows: Joint No. 28, location Fifth Avenue and Sixty-third Street; inner rail, eastbound track; poured 12.20 noon Aug. 6, 1912; weather,

clear; temperature, 70 deg. Fahr.; first cars operated over this joint at 2:30 p.m.; no special phenomena at pouring; joint inspected Aug. 7; found open 1/32 in. at the gage line and ⅛ in. at the lip, otherwise looked perfect. In this instance no cause was assigned for the break other than contraction. All broken joints of the first year's welding were found to have been made with a double and sometimes a triple pouring. Consequently, a proper segregation of the metal and a good junction with the rail had not been obtained.

COST OF CAST-WELD JOINT

The cost of the riveted joint approximated $5 each, whereas the cast-weld joint, including repairs of equipment,

COSTS FOR METAL—CAST-WELD JOINTS—SEASON 1912

Number of joints welded			1084
Pig iron used, total lb.			151,303
Scrap iron used, total lb.			63,041
Total amount metal, lb.			214,344
Pig iron per joint (61.3 per cent) lb.			121.2
Scrap iron per joint (38.7 per cent) lb.			76.6
Total metal per joint, lb.			197.8
Estimated weight metal per joint, lb.			176.0
Excess loss to slag and in pouring, lb.			21.8
Pig iron, total cost	$977.73	Cost per joint	$0.902
Scrap iron, total cost	652.12	Cost per joint	0.602
Total cost metal	$1629.85	Total cost per joint	$1.504

Excess of 21.8¾ lb. = 11 per cent of actual metal used.
Excess of 21.8¾ lb. = 12.3 per cent of estimated weight of metal in one joint.

costs a total of but $3.60. This cost would be still lower were it not for the fact that transportation conditions permit the opening of short sections only for cast-welding. The

Brooklyn Joints and Ties—Detail Showing Wedge Tie Clips Between Plates and Rail; Also Concrete Base for Paving

first element which enters into the cost of the cast-weld joint is the cupola outfit. The cost of this item, exclusive of the car on which it is mounted, was about $2700. From the accompanying table of metal costs and quantities for the welding of 1084 joints it will be seen that the proportions of pig iron and soft scrap iron tend to be respectively 60 per cent and 40 per cent.

The net weight of metal used in a joint for 7-in. rail is about 176 lb. The distribution of metal around the joint is shown in a drawing on page 920.

The pig iron referred to in the table is new and is bought to the following specifications: silicon, between 2.75 and 3.5 per cent; sulphur, not to exceed 0.03 per cent; manganese, not to exceed 0.5 per cent; phosphorus, between 0.6 and 0.8 per cent. The scrap iron consists chiefly of pieces of broken machinery. In addition to these metals, titanium alloy is used. This is purchased in 100-lb. bags at 12½ cents per pound. Three joints require 1 lb. of alloy.

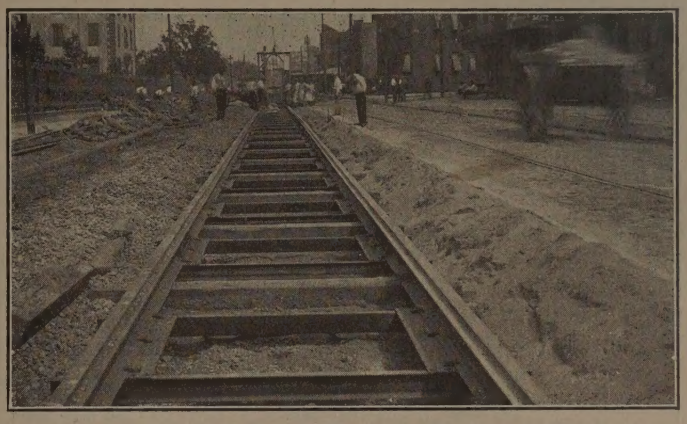
The cost of sand is not an important item when used in connection with joint welding, but it is charged against the way department at 20 cents per cubic yard.

The cupola burns coke, the approximate quantity being 40 lb. per joint. As the company pays $33.75 for 5-ton lots, the cost of coke is 13.5 cents per joint. This fuel is known as seventy-two-hour coke and must satisfy the following specifications: Fixed carbon, not less than 89 per cent; ashes, not more than 8 per cent; sulphur, not more than 0.75 per cent, and volatile matter, not in excess of 25 per cent.

Additional materials used in connection with the joints comprise the molds, clamps and other mechanical parts at $19 per set. The other charges are: labor, $1.05 per joint, and freight charges, as made by the subsidiary South Brooklyn Railway, 30 cents per joint.

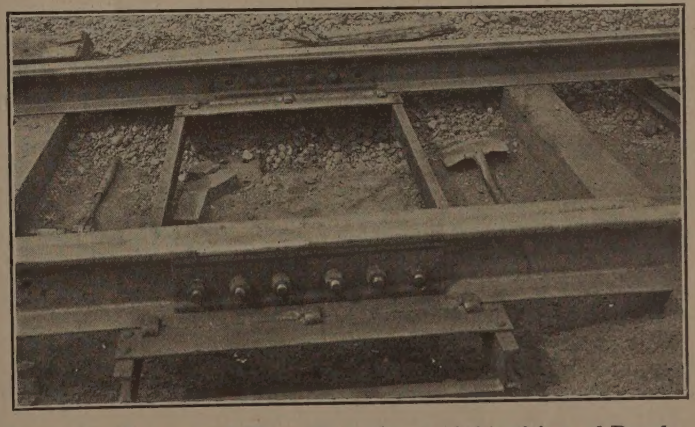
STEEL TIE CONSTRUCTION

Steel tie construction of the usual type was installed as



Brooklyn Joints and Ties—Steel Ties with Intermediate Plates

early as 1907 by the Brooklyn Rapid Transit System, but it has recently placed 300 steel ties which are novel in the manner of attachment to the rail. Various stages of installation of the new ties are shown in the accompanying views. The experiment is being carried out on a portion of Flushing Avenue, Brooklyn, where 1200 cars are operated in each direction every day. The ties are of 4-in. channel section, supplied by the International Steel Tie Company, Cleveland, Ohio. They are set 6 ft. 8 in. centers. The wooden ties shown between the steel ties were retained because the tracks are placed on a fill which averages 12 in. and also because it was necessary to interrupt the traffic as little as possible. Therefore, it was impracticable to comply with the suggestions of the manufacturer that these ties should be placed in a concrete foundation and that the concrete should be permitted to set about ten days before the operation of the cars. As a matter of fact, only a layer of 6-in. concrete is used as a foundation for the granite



Brooklyn Joints and Ties—Experimental Abolition of Bonds by Arc-Welding Tie Connection Plates and Rail

block pavement, except that the concrete is increased to a depth of 8 in. under the intermediate plates.

The most important feature of this steel tie construction is the use of plates which are installed between pairs of ties to form a skeleton box section. These plates are riveted to the top flanges of the ties and are fastened to the base of the rail by three malleable-iron wedge tie clips. As this ¼-in. plate is quite flexible, the rail fastening has a slight

chance for play, thereby tending to prevent the breakage of clips which occurs when they are fastened rigidly to the steel ties themselves. The plates, of course, make the actual gage spacing, and trackmen have found that they help greatly in the work of lining up the track. No tie rods are required with this construction. Ordinary joint plates were employed, as they were thought sufficient since a steel tie and plate come directly under each joint.

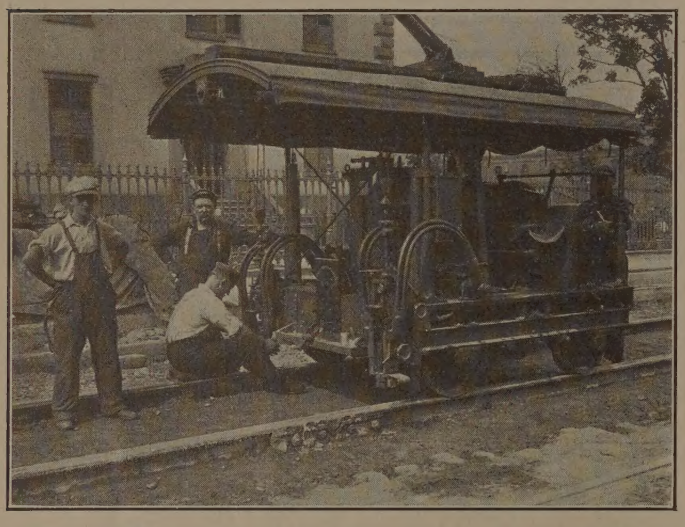
The following instructions issued by the maker of this tie were carried out on this job under its direction:

"Place the ties as nearly in line and with as nearly the desired spacing as you can, working rapidly.

"String the rails across the top of the ties in approximate position and bolt up the splices.

"Place the malleable tie clip in all the short holes in each tie before attempting to fasten the tie to the rails.

"At each rail splice pinch the rails over tight against the tie clips which have been put in place in all the short holes in the tie; then insert the clips in the wedge-shaped holes and secure them by driving the wedges in the spaces left behind the tie clips. Be sure the ties are squared up with the rail so that the clips and wedges will go into place without



Brooklyn Joints and Ties—Outfit for Brazing Bonds

undue forcing. With these ties in place at the rail splices your rails are accurately spaced to gage, and no gage spacer need be used in the entire installation.

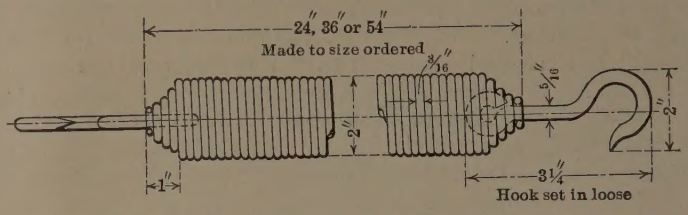
"The remaining ties are rapidly and easily fastened by having two men lift each tie up against the bottom of the rail in such position that the tie clips in the short holes in the tie do not interfere with the rail base. Then move the tie crosswise until the opening in the tie clips partly engages the bases of both rails at the same time. Force the rail base tight into the opening in the tie clips by putting a point bar into the wedge-shaped hole on the other side of the rail and prying the tie into final position. The tie clips should now be placed in the wedge-shaped holes and the wedges be driven home, finally securing the tie in place."

The cost of these ties covering a set of two channels and two plates is $4, in addition to which 3600 miscellaneous fittings were bought for 3½ cents each, making the total cost for each of the 300 ties $4.42.

All but one pair of opposite joints were furnished with the brazed bonds of the Electric Railway Improvement Company. On this pair the railway tried the experiment of arc-welding the tie plates directly to the base of the rail on each side, as shown on page 923. One of the two Indianapolis welding outfits which the company is now using for patching special work was employed for this purpose. The connection received a severe test when an effort was made to smash it with a 12-lb. sledge hammer, but even under this treatment the union refused to break.

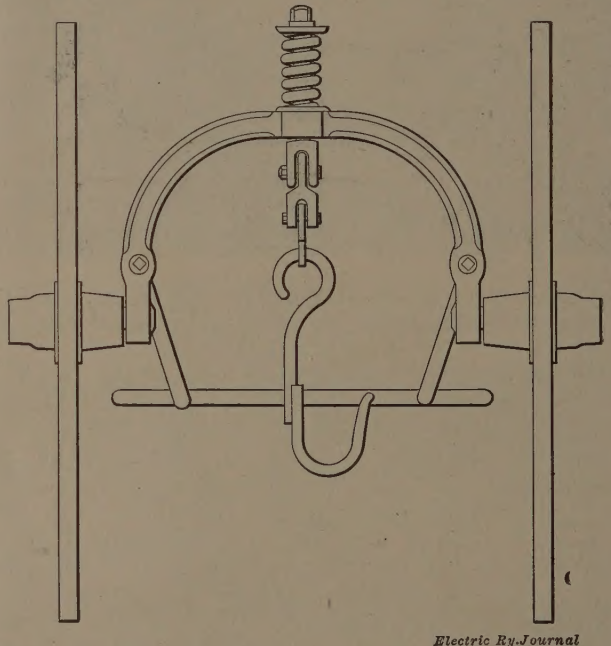
ORIGINAL DEVICES USED BY THE INTERNATIONAL RAILWAY COMPANY

Among the labor-saving devices at the Cold Springs shops of the International Railway Company is the armature wagon which is shown in detail in the accompanying



New Buffalo Devices—Springs for Train Platforms

drawing. The wagon proper consists of a cast-iron arched trunnion supported on two carriage wheels. A shaft with a cross-handle bar is bolted to the trunnion. The chief novelty is the use of the compression spring to aid in picking up and carrying armatures. Two steel hooks are carried from the two ends of a cross bar flexibly hung from a bolt which passes up through the top of the arch and through the compression spring. This bolt is threaded at the top for a nut. In use the arch is tilted first one way and then the other, thus allowing the hooks to pick up an armature from the floor. The device is very light, easy to manipulate and durable. The spring support produces such a good cushioning effect that the wagon can be run rapidly on an uneven floor without risk of injury to the armature. This armature wagon was designed by W. H. Evans when he was master mechanic of the railway.



Electric Ry. Journal

New Buffalo Devices—Front View of Armature Wagon

The upper drawing shows a spring which is installed between the dashboards to prevent passengers from getting in between cars that are operated in trains. The spring is wound up from 3/16-in. steel wire, and the ends are coned to form a socket for the eyes of the hooks. This arrangement produces a simple and effective swivel connection between the hooks and the spring. The springs are made of such lengths as to bring them nearly taut in the normal position of the cars.

A project is now being considered to construct an underground electric railway in Barcelona, Spain. The plan includes the use of electric locomotives of 3000 hp and the erection of two stations.

Statistics of Electric Railway Properties

This Article Contains a Series of Tables in Which the Statistics from a Number of Electric Railway Companies Are Grouped in Different Ways to Show Interesting Comparisons

As there is widespread interest in the statistics of electric railways, the accompanying tables have been prepared, based on the reports of sixty-nine prominent companies. The sources of information have been the *McGraw Electric Railway Manual* for 1913 and *Poor's Manual* for 1913. Pains have been taken to insure accuracy in the statistics, but in view of the complexity of the figures the correctness of the data in all details is not guaranteed. In several cases, such as the New York Railways, the Seattle Electric Company and the Mexico Tramways Company, it was necessary to use 1911 figures. Most of the reports are for the calendar year 1912, but a number of companies reported for the fiscal year ended June 30, 1912, and several reports are for the year ended in January, 1913. The period covered is twelve months in each case.

Net earnings are defined in the compilation as the gross earnings from operation less operating expenses, but some companies include taxes in operating expenses and so these are not fairly comparable with the operating ratios of the majority of companies, which follow strictly the classification of the American Electric Railway Accountants' Association. The United Railways Company of St. Louis has included an allowance for depreciation in the amount which it reports for operating expenses.

The interest and rental column, Table I, gives the figures reported for the year as interest on funded and floating debt and rentals of leased lines, and where these were not reported the amount was computed as closely as possible from the data given concerning funded debt.

TABLE II, SHOWING OPERATING RATIOS

Railway Only

1.	Hudson-Manhattan Railroad, New York	36.04
2.	Interborough Rapid Transit, New York	41.76
3.	United Railways & Electric, Baltimore	45.14
4.	South Side Elevated, Chicago	45.26
5.	Metropolitan West Side Elevated, Chicago	46.93
6.	Capital Traction, Washington, D. C	48.50
7.	Mexico Tramways, City of Mexico (includes taxes) (1911)	48.57
8.	Denver City Tramway	50.08
9.	Twin City Rapid Transit, Minneapolis	51.13
10.	Northwestern Elevated, Chicago	51.76
11.	Omaha & Council Bluffs Street Railway	52.40
12.	Toronto Railway	52.62
13.	Winnipeg Electric Railway (includes taxes)	53.22
14.	Brooklyn Rapid Transit	54.51
15.	Indianapolis Traction & Terminal	56.18
16.	Louisville Railway (includes taxes)	57.18
17.	United Railroads, San Francisco (includes taxes)	57.59
18.	Third Avenue Railway, New York City	61.27
19.	United Traction, Albany	61.33
20.	New York State Railways, Rochester	61.88
21.	Rhode Island Company, Providence	62.24
22.	Memphis Street Railway (includes taxes)	63.24
23.	Connecticut Company	63.87
24.	United Railways, St. Louis (includes depreciation)	63.91
25.	Philadelphia Rapid Transit (includes taxes)	64.20
26.	Chicago City Railway (includes taxes)	64.65
27.	Bay State Street Railway, Boston	64.76
28.	New York Railways (1911) (New York City)	64.87
29.	Chicago Railways (includes taxes)	64.89
30.	International Traction, Buffalo (includes taxes)	65.95
31.	Detroit United Railway	66.10
32.	Pacific Electric Railway, Los Angeles	66.52
33.	Spokane & Inland Empire Railroad	66.83
34.	Montreal Tramways (includes taxes)	67.21
35.	Pittsburgh Railways	67.43
36.	Puget Sound Electric Railway, Tacoma (1911)	68.14
37.	Boston Elevated Railway	69.02
38.	Los Angeles Railway Corporation (includes taxes)	69.53
39.	Cleveland Railway	74.24
40.	British Columbia Electric Railway	75.03
	Average	59.09

Railway, Electric Light and Power

1.	Milwaukee, Light, Heat & Traction	44.50
2.	Portland (Ore.) Railway, Light & Power (also gas) (includes taxes)	50.12
3.	Washington Water Power, Spokane (includes taxes)	50.54
4.	Milwaukee Electric Railway & Light	51.47
5.	New Orleans Railway & Light (also gas)	51.61
6.	St. Joseph Railway, Light, Heat & Power	52.00
7.	Northern Texas Electric (includes taxes)	52.60
8.	Virginia Railway & Power, Richmond, Va	53.14
9.	Utah Light & Railway (includes taxes)	53.17
10.	West Penn Traction & W. P. (includes taxes)	53.67
11.	Tri-City Railway & Light (also gas)	53.94
12.	Georgia Railway & Electric, Atlanta (also gas) (includes taxes)	54.31
13.	Public Service Corporation of New Jersey (also gas) (includes taxes)	54.44
14.	Columbus Railway & Light	54.44
15.	Washington Railway & Electric (includes taxes)	54.77
16.	Ohio Electric Railway	55.37
17.	Seattle Electric (1911)	56.00
18.	Northern Ohio Traction & Light (includes taxes)	56.83
19.	Kansas City Railway & Light	57.17
20.	Nashville Railway & Light (includes taxes)	57.29
21.	Union Traction Company of Indiana	57.87
22.	Galveston-Houston Electric (includes taxes)	58.34
23.	Terre Haute, Indianapolis & Eastern	58.62
24.	Illinois Traction (also gas) (includes taxes)	58.71
25.	Birmingham Railway, Light & Power (also gas) (includes taxes)	59.63
26.	Dallas Electric Corporation (includes taxes)	60.01
27.	Republic Railway & Light, Youngstown, Ohio (also gas) (includes taxes)	60.23
28.	Toledo Railways & Light (also gas) (includes taxes)	70.10
	Average	55.28

TABLE III, SHOWING PER CENT SURPLUS OF GROSS REVENUE

Railways Only

1.	Capital Traction (Washington)	33.8
2.	Winnipeg Electric Railway	31.7
3.	Twin City Rapid Transit (Minneapolis and St. Paul)	30.2
4.	Louisville Railway	26.6
5.	Toronto Railway	26.4
6.	South Side Elevated, Chicago	21.2
7.	British Columbia Electric Railway (Vancouver)	20.9
8.	Interborough Rapid Transit (New York City)	20.8
9.	New York State Railways, Rochester	20.4
10.	Montreal Tramways	19.2
11.	Omaha & Council Bluffs Street Railway	19.0
12.	Connecticut Company (New Haven-Hartford et al.)	18.8
13.	Chicago City Railway	17.6
14.	Detroit United Railway	16.6
15.	Bay State Street Railway (Boston)	16.5
16.	Metropolitan West Side Elevated, Chicago	16.4
17.	United Traction, Albany	16.0
18.	Brooklyn Rapid Transit	15.9
19.	Denver City Tramway	15.5
20.	Los Angeles Railway	14.3
21.	Third Avenue Railway (New York City)	13.8
22.	Cleveland Railway	13.0
23.	Memphis Street Railway	11.9
24.	International Traction, Buffalo	11.2
25.	United Railways of St. Louis	9.3
26.	New York Railways (1911) (New York City)	8.3
27.	United Railways & Electric, Baltimore	7.8
28.	Rhode Island Company (Providence)	7.5
29.	United Railroads of San Francisco	7.4
30.	Pacific Electric Railway, Los Angeles	5.5
31.	Northwestern Elevated, Chicago	4.6
32.	Indianapolis Traction & Terminal	4.2
33.	Boston Elevated Railway	4.2
34.	Chicago Railways	2.6
	Average	15.9

Railway, Electric Light and Power

1.	Milwaukee Light, Heat & Traction	55.2
2.	Washington Water Power	41.1
3.	Georgia Railway & Electric (also gas)	32.9
4.	Northern Texas Electric	32.5
5.	Milwaukee Electric Railway & Light	28.9
6.	Northern Ohio Traction & Light	25.7
7.	Terre Haute, Indianapolis & Eastern	25.4
8.	Utah Light & Railway	24.9
9.	Dallas Electric Corporation	24.0
10.	Portland Railway, Light & Power (also gas)	23.3
11.	St. Joseph Railway, Light, Heat & Power	23.3
12.	West Penn Traction & Water Power	23.0
13.	Washington Railway & Electric	22.2
14.	Nashville Railway & Light	21.7
15.	Galveston-Houston Electric	21.6
16.	Tri-City Railway & Light (also gas)	20.6
17.	Birmingham Railway, Light & Power (also gas)	20.0
18.	Republic Railway & Light (also gas)	19.8
19.	Seattle Electric (1911)	18.7
20.	Virginia Railway & Power	16.0
21.	New Orleans Railway & Light (also gas)	15.0
22.	Kansas City Railway & Light	14.9
23.	Illinois Traction (also gas)	14.6
24.	Public Service Corporation of New Jersey (also gas)	6.3
25.	Union Traction Company of Indiana	5.4
26.	Columbus Railway & Light Company	2.2
	Average	22.2

The surplus is the balance remaining after deduction for operating expenses, taxes, interest, sinking fund and other charges, and it therefore represents the amount applicable to the stock, although charges for depreciation are made by some companies against the surplus so determined. Dividends are not always paid from the surplus of the current year's operations, as in the case of the Boston Elevated Railway, which suffered from a strike in 1912, but are paid in part from the accumulated surplus of previous years.

TABLE I, SHOWING STATISTICS OF SIXTY-NINE ELECTRIC RAILWAY PROPERTIES IN THE UNITED STATES, CANADA AND MEXICO

	Year Ended	Gross Reven	Net Earnings	Operating Ratio	Interest and Rentals	Surplus Before Dividend	Per Cent Surplus to Gross	Preferred Stock	Common Stock	Dividend on Common	Funded Debt	Population, Census 1910	Gross Revenue per Capita	Gross Revenue per $1 Int. and Rentals, Dollars	Miles of Track	Gross Revenue per Mile of Track	Funded Debt per Mile of Track	Population per Mile of Track	Funded Debt per $1 Gross Earnings, Dollars	Ratio of Net Earnings to Interest	Total Capitalization per $1 Gross	Total Capitalization per Capita
ALABAMA																						
Birm'h'm Ry., Lt. & Pr. Co.	Dec.	1912	$3,005,888	$1,213,772	59.63†	$597,385	$616,387	20	$3,500,000	$3,500,000	8%	$12,484,000	132,685	$22.65	5.03	138	$21,781	$90,469	961	4.15	2.03	$6.48	$146
CALIFORNIA																						
United RRs. of San Francisco	Dec.	1912	8,471,676	3,593,094	57.59†	2,071,100	627,951	7.4	25,000,000	17,948,600	*b*	41,450,000	416,912	20.32	4.09	267	31,729	155,243	1561	4.89	1.73	9.96	202
Los Angeles Rwy. Corp.	June	1912	6,206,294	1,891,105	69.53†	1,102,500	888,605	14.3	*b*	20,000,000	2%	20,000,000	319,198	19.44	5.63	365	17,003	54,794	874	3.22	1.71	6.44	125
Pac. Elec. Ry., Los Angeles	June	1912	8,645,504	2,895,216	66.52	2,195,944	477,815	5.5	*b*	74,000,000	*b*	52,580,000	.....	.....	3.93	882	9,801	59,614	....	6.08	1.31	14.98	.....
COLORADO																						
Denver City Tramway Co.	Dec.	1912	3,422,372	1,708,472	50.08	*f*898,400	531,432	15.5	*b*	6,000,000	8%	17,893,000	213,381	16.03	3.80	229	14,944	78,135	931	5.19	1.90	6.98	112
CONNECTICUT																						
The Connecticut Co.	June	1912	8,075,542	2,918,321	63.87	1,012,539	1,519,076	18.8	8,142,900	49,057,200	3½%	33,026,000*f*	.....	.....	7.92	796	10,145	41.490	....	4.08	2.88	11.17	.....
DISTRICT OF COLUMBIA																						
Capital Traction Co.	Dec.	1912	2,265,214	1,166,557	48.50	281,781	767,126	33.8	*b*	12,000,000	6%	5,639,500	331,069	20.78 com. earnings	8.03	58	39,055	97,232	1518	2.49	4.13	7.78	174 com-b'n'd
Washington Ry. & Elec. Co.	Dec.	1912	4,618,328	2,090,104	54.77†	1,107,607	1,026,937	22.2	8,500,000	6,702,900	3%	24,870,869			4.13	160	28,864	155,443		5.38	1.88	8.67	
GEORGIA																						
Georgia Rwy. & Elec. Co.	Dec.	1912	4,968,790	2,270,789	54.31†	633,101	1,637,688	32.9	2,400,000	8,514,600	8%	12,648,000	154,839	32.09	7.84	199	24,/17	63,558	778	2.54	3.58	4.74	152
ILLINOIS																						
Chicago City Ry. Co.	Jan.	1913	11,243,981	*m*3,975,424	64.65†	1,286,102	1,982,507	17.6	*b*	18,000,000	11%	27,200,000	2,185,283	17.44	8.74	314	35,808	86,624	Chicago combin'd 976 miles 2239 pop	2.42	3.09	4.02	.....
Chicago Rwys. Co.	Jan.	1913	18,076,777	6,348,275	64.89†	4,115,669	475,077	2.6	*b*	*p*100,000	*p*	90,086,591	2,185,283	combined	4.39	417	37,897	188,860		4.98	1.54	4.98	.....
Met. W. Side Elev., Chicago	June	1912	2,976,998	1,580,017	46.93	914,694	488,376	16.4	8,707,800	7,464,100	3%	15,140,000	2,185,283	gross earn.	3.25	58	51,327	261,034		5.08	1.72	10.51	108
Northwestern Elev., Chicago	June	1912	2,539,705	1,225,311	51.76	1,455,691	117,755	4.6	4,944,400	4,947,100	*b*	25,000,000	2,185,283	Chicago	1.74	60	42,328	416,666		9.84	.84	13.56	com-b'n'd
South Side Elev., Chicago	June	1912	2,443,589	1,338,020	45.26	686,763	518,111	21.2	*b*	10,231,400	6¾%	8,000,000	2,185,283	†38,127,891	3.55	47	51,991	170,213		3.27	1.94	7.46	
Illinois Traction Co.	Dec.	1912	7,415,647	3,062,433	58.71†	1,975,969	1,086,464	14.6	6,988,400	10,984,900	*b*	34,517,000	.....	.....	3.75	609	12,176	56,668	.....	4.65	1.54	7.08	.....
INDIANA																						
Indianapolis Tr. & Ter. Co.	Dec.	1912	3,343,640	1,465,477	56.18	1,013,250	139,296	4.2	*b*	5,000,000	4%	15,460,000	233,650	14.31	3.30	140	23,883	110,428	1597	4.62	1.44	5.94	87
T're H'te, Ind'p'l's & E.T.Co.	June	1912	2,410,769	997,362	58.62	952,296	614,305	25.4	9,100,000	9,100,000	*b*	7,479,000	.....	.....	2.53	446	5,405	48,565	.....	3.10	1.05	10.65	.....
T're H'te, Ind'p'l's & E.T.Co., including controlled lines.	Dec.	1912	6,432,060	2,617,632	59.30†	2,085,803	531,729	8.3	.....	.....	....	.....	.....	.....	3.08	446	14,421	.....	.....	....	1.30	.....	.....
Union Trac. Co. of Indiana	Dec.	1912	2,308,649	972,808	57.87	765,711	126,592	5.4	4,000,000	5,000,000	*b*	13,238,500	.....	.....	3.01	423	5,458	31,297	.....	5.73	1.27	9.63	.....
IOWA																						
Tri-City Ry. & Lt. Co., Dav'p't	Dec.	1912	3,090,209	1,423,356	53.94	584,077	631,682	20.6	3,000,000	9,000,000	2%	12,305,000	100,000*f*	30.90	5.28	87	35,519	141,437	1149	3.97	2.29	7.86	243
KENTUCKY																						
Louisville Railway Co.	Dec.	1912	3,130,492	1,340,455	57.18†	535,833	789,213	26.6	2,500,000	5,456,500	4%	10,999,000	223,928	13.97	5.84	167	18,745	65,682	1340	3.51	2.50	6.30	84
LOUISIANA																						
New Orleans Ry. & Lt. Co.	Dec.	1912	6,628,147	3,207,791	51.61	1,614,021	995,032	15.	10,000,000	20,000,000	1½%	32,934,900	339,075	19.54	4.10	207	32,020	159,106	1638	4.95	1.98	9.49	185
MARYLAND																						
Unit. Rys. & El. Co., Balti.	Dec.	1912	8,571,489	4,702,613	45.14	2,208,338	677,082	7.8	24,000	15,870,000	3%	54,244,000	558,485	15.35	3.88	403	21,269	134,600	1385	6.32	2.13	8.18	125
MASSACHUSETTS																						
Bay State St. Ry. Co., Boston	June	1912	8,877,943	3,127,891	64.76	1,317,042	1,469,463	16.5	2,088,600	20,841,000	5%	23,386,500	.....	.....	6.74	957	9,276	24,437	.....	2.63	2.37	5.21	.....
Boston Elev. Rwy. Co.	June	1912	15,904,047	4,927,412	69.02	3,618,782	705,368	4.2	6,400,000	32,613,150	6%	36,571,000	670,585	23.73	4.39	507	31,368	72,132	1322	2.29	1.36	4.74	112
MICHIGAN																						
Detroit United Railway	Dec.	1912	11,695,530	3,965,121	66.10	2,123,513	1,950,465	16.6	*b*	12,525,000	5%	37,148,000	*f*600,000	19.49	5.50	793	14,749	46,845	*f*756	3.18	1.86	4.25	83
MINNESOTA																						
Twin City Rapid Transit Co.	Dec.	1912	8,208,967	4,010,966	51.13	1,137,490	2,481,736	30.2	3,000,000	20,100,000	6%	19,503,000	526,350	15.59	7.21	402	20,420	48,514	1309	2.37	3.52	5.19	81
MISSOURI																						
Kansas City Ry. & Lt. Co.	May	1912	8,350,623	3,576,361	57.17	1,464,580	1,245,263	14.9	9,407,500	9,615,430	*b*	28,531,100	248,831	33.20	5.70	261	31,995	109,314	915	3.41	2.44	5.69	191
United Rys. of St. Louis	Dec.	1912	12,251,090	4,422,589	63.91*	2,696,197	1,139,088	9.3	19,986,500	24,913,800	*b*	59,480,000	687,029	17.82	4.54	461	26,575	129,024	1490	4.85	1.64	8.52	152
St. Joseph Ry., Lt., Ht. & Pr.	Dec.	1912	1,179,839	566,345	52.00	236,060	274,756	23.3	1,560,000	3,500,000	2%	4,716,000	77,403	15.24	4.99	47	25,103	100,340	1648	3.99	2.39	8.28	126
NEW JERSEY																						
Public Service Corporation	Dec.	1912	32,654,469	14,875,035	54.44†	14,039,073	2,053,224	6.3	.....	84,389,350	6%	178,467,298	2,028,947	8.07*s*	2.32	844	18,320*s*	76,255*s*	2240	5.46	1.06	8.04	129

*Includes depreciation. †Includes taxes. *b* None. *f* Estimated *m* Expenses include operating expenses, taxes and renewals, of combined systems, interest on capital investment of Chicago City R'y Co. and net earnings of Southern Street Ry. Co. *p* Subject of trust agr eement under which four series of participation certificates have been issued representing 265,100 equal parts. $12 was paid during fiscal year on Series I. *r* Earnings for five Chicago roads in table and the 1911 earnings for Chicago & Oak Park Elevated figured on Chicago's population proper. *s* Railway only. Debt per mile is for Public Service Railway and controlled companies.

TABLE I, SHOWING STATISTICS OF SIXTY-NINE ELECTRIC RAILWAY PROPERTIES IN THE UNITED STATES, CANADA AND MEXICO (*Continued*)

	Year Ended	Gross Revenue	Net Earnings	Operating Ratio	Interest and Rentals	Surplus Before Dividend	Per Cent Surplus to Gross	Preferred Stock	Common Stock	Dividend on Common	Funded Debt	Population, Census 1910	Gross Revenue per Capita	Gross Revenue per $1 Int. and Rentals, Dollars	Miles of Track	Gross Revenue per Mile of Track	Funded Debt per Mile of Track	Population per Mile of Track	Funded Debt per $1 Gross Earnings, Dollars	Ratio of Net Earnings to Interest	Total Capitalization per $1 Gross	Total Capitalization per Capita
NEBRASKA																						
Omaha & Coun. Bluffs St. Ry.	Dec.	1912	$2,846,053	$1,354,748	52.40	$531,940	$541,337	19.0	$5,500,000	$6,500,000	5%	$12,090,000	153,388	$18.55	5.35	159	$17,899	$76,037	965	4.24	2.54	$8.46	157
NEW YORK																						
Brooklyn Rapid Transit	June	1912	23,226,550	10,614,491	54.51	5,446,219	3,711,222	15.9	*b*	44,837,218	5%	84,362,500	Brooklyn:	15.07	4.26	614	37,828	137,403	2561	3.63	1.94	5.56	84
Hudson & Manhattan R.R.	Dec.	1912	3,630,061	2,321,95(	36.04	2,879,081	*a*74,532	....	5,242,151	39,994,890	*b*	*e*73,524,000	1,634,351	Gr.N.Y.	*e*1.59	19	191,056	*e*3869,473	....	*e*1692	....	32.71	.....
Interborough Rapid Transit.	June	1912	31,246,392	18,198,59(	41.76	11,000,593	6,523,766	20.8	*b*	*k*95,000,000	*d*	*f*89,749,000	4,766,883	Combined	2.84	203	153,923	*g*575.988	Gt. N.Y.	2.87	1.65	5.91	.....
													Greater	Earnings				*h*345.678	3138				Com-
New York Rwys. Co.	June	1911	13,600,317	4,778,401	64.87	2,597,385	1,138,155	8.3	*b*	24,508,000	*b*	67,924,344	New York	82,894,364	5.23	165	82,426	411,662	....	4.99	1.83	6.79	b'n'd
Third Ave. Rwy., N. Y.	Dec.	1912	9,547,529	3,698,38(	61.27	1,325,346	1,318,909	13.8	*b*	20,736,000	*b*	70,316,365		=17.39	7.20	317	30,118	231,936	.....	7.70	2.79	9.53	N.Y.
														per cap.									111
U. Y. State Rwys., Rochester	Dec.	1912	7,542,195	2,875,35(	61.88	1,145,928	1,541,055	20.4	3,862,500	20,277,700	6%	18,672,500	*f*700,000	10.77	0.58	359	21,009	52,012	*f*2000	2.47	2.50	5.67	61
Nnited Trac. Co., Albany	June	1912	2,592,638	1,002,82(	61.33	372,630	415,713	16.0	*b*	12,500,000	4%	6,500,000	*f*225,000	11.52	6.95	101	25,669	65,000	*f*2227	2.50	2.68	7.32	84
International Trac., Buffalo	Dec.	1912	6,393,796	2,177,625	65.95†	1,841,600	719,419	11.2	5,000,000	10,000,000	2%	40,303,000	*f*500,000	12.79	3.47	269	23,768	149,825	*f*2000	6.30	1.18	8.64	110
OHIO																						
Cincinnati Traction Co.	June	1912	5,183,123	2,466,945	52.40	1,134,337	664,709	12.8	.....	20,511,950	5%	907,000	364,463	14.22	4.57	442	11,726	.....	825	....	2.17	4.13	58
Cleveland Rwy.	Dec.	1912	6,648,755	1,713,181	74.24	512,211	865,397	13.0	*b*	15,074,600	6%	10,000,000	560,653	11.85	12.98	265	25,089	37,735	2113	1.30	3.31	3.77	45
Columbus Rwy. & Lt.	Dec.	1912	2,932,653	1,336,41(	54.44	920,638	75,014	2.2	4,766,300	9,460,500	*b*	9,482,000	210,000	13.96	3.18	132	22,209	71,833	1590	3.23	1.44	8.08	112
Republic Rwy. & Lt.	Dec.	1912	2,663,762	1,058,271	60.23†	527,252	528,746	19.8	5,187,800	6,204,000	*b*	11,950,000	*f*215,000	12.38	5.05	156	17,075	76,602	1378	4.48	2.00	8.76	108
Northern Ohio Trac. & Lt.	Dec.	1912	2,996,036	1,293,271	56.83†	523,067	770,203	25.7	1,943,960	9,000,000	5%	10,635,000	*f*300,000	9.98	5.72	216	12,378	49,236	1388	3.55	2.47	7.20	72
Ohio Electric Railway	June	1912	3,351,543	1,496,26(	55.37	1,528,662	*a*6,910	....	11,100,000	13,672,500	*b*	19,952,000	.....	.....	2.19	670	5,002	29,779	....	5.95	....	13.34	....
Toledo Railways & Light	Dec.	1912	3,979,275	1,189,848	70.10†	.....	.....	....	.....	.....	*b*	.....	.....	.....	....	243	16,333	.....	.....	....	....	.....	.....
OREGON																						
Portland Rwy., Lt. & Power.	Dec.	1912	6,642,308	3,313,397	50.12†	1,760,991	1,552,406	23.3	*b*	25,000,000	4%	34,000,000	.....	.....	3.77	294	22,592	115,646	....	5.12	1.88	8.88	....
PENNSYLVANIA																						
Phila. Rapid Transit	June	1912	21,727,468	7,778,637	64.20†	8,902,350	*a*150,489	....	*b*	29,977,120	*b*	81,489,421	1,549,008	14.02	2.44	643	33,790	126,733	2409	3.75	0	5.13	72
Pittsburgh Rwys.	June	1912	10,666,931	3,474,551	67.43	5,357,756	*a*2,534,564	....	17,500,000	58,003,860	*b*	36,830,500	*f*700,000	15.24	1.98	592	18,019	62,213	*f*1180	3.45	0	10.53	160
W. Penn. Trac. & W. Pwr. Co.	Dec.	1912	3,408,586	1,579,127	53.67†	794,748	784,379	23.0	10,872,400	20,497,400	4%	18,714,000	*f*500,000	6.81	4.28	302	11,286	61,966	*f*1653	5.48	1.98	14.69	100
RHODE ISLAND																						
Rhode Island Co., Providence	June	1912	5,139,940	1,941,190	62.24	1,175,003	387,599	7.5	*b*	19,519,500	3%	16,937,200	.....	.....	4.37	347	14,812	48,810	.....	3.29	1.65	7.09	....
TENNESSEE																						
Memphis Street Rwy. Co.	Dec.	1912	1,937,308	712,175	63.24†	481,298	230,877	11.9	2,500,000	2,500,000	1%	9,343,000	131,105	14.77	4.02	125	15,498	74,744	1048	4.82	1.47	7.40	109
Nashville Rwy. & Light Co.	Dec.	1912	2,074,990	886,046	57.29†	434,812	451,234	21.7	2,500,000	4,000,000	4%	8,950,000	110,364	18.80	4.77	82	25,304	109,146	1345	4.31	2.03	7.44	140
TEXAS																						
Dallas Elec. Corp.	Dec.	1912	1,821,562	728,768	60.01†	227,745	438,511	24.0	4,210,000	4,418,000	5%	5,699,000	92,104	19.77	7.99	64	28,465	89,047	1439	3.12	3.19	7.86	155
Galveston-Houston Elec. Co.	Dec	1912	2,027,656	844,974	58.34†	348,521	439,319	21.6	2,972,700	3,000,000	3½%	6,774,000	147,300	13.76	5.81	144	14,080	47,041	1023	3.34	2.42	6.28	86
Northern Texas Elec. Co.	Dec.	1912	1,790,762	849,073	52.60†	246,391	583,000	32.5	4,000,000	2,500,000	6%	5,584,000	208,000	8.61	7.27	168	10,659	33,238	1238	3.11	3.44	6.74	53
UTAH																						
Utah Light & Rwy. Co.	June	1912	2,604,722	1,220,042	53.17†	*f*229,900	649,041	24.9	3,863,175	1,942,500	*b*	4,821,000	92,777	28.07	11.32	125	20,837	38,568	742	1.85	5.30	4.07	114
VIRGINIA																						
Virginia Rwy. & Power Co.	June	1912	4,558,194	2,135,290	53.14	1,116,950	729,769	16.0	7,698,400	13,595,100	2%	22,027,500	.....	.....	3.89	273	16,696	80,686	.....	4.83	1.91	9.50	....
WASHINGTON																						
Puget Sound Elec. Ry., Tac.	Dec.	1911	1,766,742	563,084	68.14	*f*418,100	*a*44,494	....	1,125,000	3,500,000	*b*	5,604,000	*f*100,000	17.67	4.22	216	8,179	25,963	*f*460	3.17	1.34	5.73	102
Seattle Electric Company	Dec.	1911	5,440,955	2,394,102	56.00	1,208,811	1,020,766	18.7	5,000,000	8,433,500	7%	20,740,000	*f*275,000	19.42	4.50	245	22,208	84,653	1122	3.81	1.98	6.28	114
Spokane & Inland Emp. R.R.	June	1912	1,632,509	541,706	66.83	440,707	*a*70,168	....	6,409,100	10,000,000	*b*	4,816,500	.....	.....	3.70	290	5,629	16,508	....	2.95	1.23	13.00	....
Washington Wtr. Pr., Spok'e	Dec.	1912	3,170,245	1,567,892	50.54†	264,438	1,303,454	41.1	*b*	14,081,900	8%	5,628,000	104,402	30.36	11.98	112	28,305	50,250	932	1.77	5.93	6.21	188
WISCONSIN																						
Mil. Elec. Ry. & Lt. Co.	Dec.	1912	5,682,356	2,757,775	51.47	715,206	1,643,803	28.9	4,500,000	9,850,000	6%	16,849,000	373,857	15.19	7.94	142	40,016	118,655	} 2632‡	2.96	3.85	5.49	83
Mil. Lt., Ht. & Trac. Co.	Dec.	1912	1,237,384	686,758	44.50	665,706	683,329	55.2	*b*	10,000,000	*b*	11,189,000	.....	.....	1.86	224	5,524	49,950		9.04	1.03	17.12	....
CANADA																						
Brit. Columbia Elec. Rwy.	June	1912	5,974,524	1,492,302	75.03	492,082	1,249,701	20.9	*b*	14,550,000	8%	11,469,547	.....	.....	12.14	286	20,889	40,103	....	1.92	3.03	4.35	....
Montreal Tramways	Jan.	1913	6,378,212	2,091,695	67.21†	865,560	1,226,135	19.2	*l*16,000,000	2,000,700	10%	14,871,863	500,000	12.75	7.36	237	26,912	62,750	2109	2.33	2.41	5.15	66
Toronto Railway	Dec.	1912	5,448,050	2,581,500	52.62	190,992	1,448,458	26.4	*b*	11,000,000	8%	3,658,940	370,000	14.72	28.52	119	45,781	30,747	3109	.67	13.50	2.69	39
Winnipeg Elec. Rwy.	Dec.	1912	3,765,384	1,761,236	53.22†	359,557	1,194,463	31.7	*l*2,434,602	9,000,000	12%	5,000,000	175,000	21.51	10.47	129	29,189	38,759	1357	1.32	4.89	4.36	94
MEXICO																						
Mexico Tramways Co.	Dec.	1911	6,176,971	3,176,619	48.57†	*f*815,000	.....	....	*b*	20,000,000	7%	15,083,333	329,774	18.73	7.57	195	31,676	77,350	1691	2.44	....	5.68	106

*Includes depreciation. †Includes taxes. *a* Deficit. *b* None. *d* 7 Manhattan and 9 Inter. Includes Terminal Building. *f* Estimated. *g* Subway. *h* Elevated. *k* Includes Manhattan Ry. *l* Debentures.
‡Population of Milwaukee and mileage of Milwaukee Ry. & Lt. Co., only considered.

TABLE IV, SHOWING GROSS REVENUE PER CAPITA

Railway Only

1.	Boston (Boston Elevated)	$23.73
2.	Winnipeg	21.51
3.	San Francisco (United Railroads)	20.32
4.	Detroit (Detroit United Railway) (estimated)	19.49
5.	Los Angeles (Los Angeles Railway)	19.44
6.	Mexico City (1911)	18.73
7.	Omaha and Council Bluffs	18.55
8.	St. Louis	17.82
9.	Chicago, combined companies. (See text)	17.44
10.	New York City, combined companies. (See text)	17.39
11.	Denver	16.03
12.	Minneapolis and St. Paul	15.59
13.	Baltimore (United Railway & Electric)	15.35
14.	Pittsburgh (Pittsburgh Railways) (estimated)	15.24
15.	Brooklyn (Brooklyn Rapid Transit, Coney Island & Brooklyn)	15.07
16.	Memphis	14.77
17.	Toronto	14.72
18.	Indianapolis (Indianapolis Traction & Terminal)	14.31
19.	Cincinnati (Cincinnati Traction)	14.22
20.	Philadelphia	14.02
21.	Louisville	13.92
22.	Buffalo (estimated)	12.79
23.	Montreal	12.75
24.	Cleveland	11.85
25.	Albany et al. (United Traction) (estimated)	11.52
26.	Rochester, Syracuse et al. (New York State Railways) (estimated)	10.77
27.	Milwaukee (Milwaukee Railway & Lighting)	10.60
28.	Public Service Railway of New Jersey	8.07
	Average	15.85

Railway, Electric Light and Power

1.	Kansas City	$33.20
2.	Atlanta (Georgia Railway & Electric)	32.09
3.	Davenport, Rock Island and Moline (estimated)	30.90
4.	Spokane (Washington Water Power)	30.36
5.	Salt Lake City	28.07
6.	Seattle (Seattle Electric) (1911)	22.93
7.	Birmingham	22.65
8.	Washington, D. C. (combined companies)	20.78
9.	Dallas	19.77
10.	New Orleans	19.54
11.	Nashville	18.80
12.	Tacoma	17.67
13.	St. Joseph	15.24
14.	Columbus	13.96
15.	Youngstown et al. (Republic Railway & Light)	12.38
16.	Akron and Barberton (Northern Ohio Traction & Light) (estimated)	9.98
	Average	21.77

TABLE V, SHOWING GROSS REVENUE PER $1 INTEREST

Railway Only

1.	Toronto Railway	$28.52
2.	Cleveland Railway	12.98
3.	British Columbia Electric Railway	12.14
4.	Winnipeg Electric Railway	10.47
5.	Chicago City Railway	8.74
6.	Capital Traction, Washington, D. C.	8.03
7.	Connecticut Company	7.92
8.	Mexico Tramways (1911)	7.57
9.	Montreal Tramways	7.36
10.	Twin City Rapid Transit, Minneapolis	7.21
11.	Third Avenue, New York	7.20
12.	United Traction, Albany	6.95
13.	Bay State Street Railway, Boston	6.74
14.	New York State Railways, Rochester	6.58
15.	Louisville Railway	5.84
16.	Los Angeles Railway Corporation	5.63
17.	Detroit United Railway	5.50
18.	Omaha & Council Bluffs Street Railway	5.35
19.	New York Railways (1911)	5.23
20.	Cincinnati Traction	4.57
21.	United Railways of St. Louis	4.54
22.	Chicago Railways	4.39
23.	Boston Elevated Railway	4.39
24.	Rhode Island Company	4.37
25.	Brooklyn Rapid Transit	4.26
26.	Puget Sound Electric Railway (1911)	4.22
27.	United Railroads of San Francisco	4.09
28.	Memphis Street Railway	4.02
29.	Pacific Electric Railway, Los Angeles	3.93
30.	United Railways & Electric, Baltimore	3.88
31.	Denver City Tramway	3.80
32.	Spokane & Inland Empire	3.70
33.	South Side Elevated, Chicago	3.55
34.	International Traction, Buffalo	3.47
35.	Indianapolis Traction & Terminal	3.30
36.	Metropolitan West Side Elevated, Chicago	3.25

Railway, Electric Light and Power

1.	Washington Water Power, Spokane	$11.98
2.	Utah Light & Railway	11.32
3.	Dallas Electric Corporation	7.99
4.	Milwaukee Electric Railway & Light	7.94
5.	Georgia Railways & Electric (also gas)	7.84
6.	Northern Texas Electric	7.27
7.	Galveston-Houston Electric	5.81
8.	Northern Ohio Traction & Light	5.72
9.	Kansas City Railway & Light	5.70
10.	Tri-City Railway & Light (also gas)	5.28
11.	Republic Railway & Light (also gas)	5.05
12.	Birmingham Railway, Light & Power (also gas)	5.03
13.	St. Joseph Railway, Light & Power	4.99
14.	Nashville Railway & Light	4.77
15.	Seattle Electric (1911)	4.50
16.	West Penn Traction & Water Power	4.28
17.	Washington Railway & Electric, Washington, D. C.	4.13
18.	New Orleans Railway & Light (also gas)	4.10
19.	Virginia Railway & Power	3.89
20.	Portland Railway, Light & Power (also gas)	3.77
21.	Illinois Traction (also gas)	3.75

It has been particularly difficult to make the statistics of capitalization accurate. The reports of the numerous holding companies are incomplete with respect to the outstanding securities of their subsidiary companies. On account of the pending reorganization of the Toledo Railways & Light Company property the capitalization of this system is omitted.

Table I gives the details for all of the companies, arranged according to the states in which they mainly operate. Tables II to XII inclusive contain practically the same information but with the companies arranged according to their rank under each heading.

Table II gives the operating ratios in accordance with the total figures reported. The companies doing business in both railway and lighting service are not fairly comparable with those which confine their operations mainly to the railway, and they are therefore grouped by themselves. The low operating ratios of the subway and elevated companies are noticeable in comparison with the surface lines. They are not subject to the expensive blockades to traffic, removal of snow, etc., that hamper the surface roads. The Mexico Tramways Company had a low operating ratio of 48.57 per cent, due probably in part to a low rate of wages. Some Western cities, like Minneapolis and St. Paul, Denver and Omaha, also show low operating ratios. The average ratio for forty railways was 59.09 and for twenty-eight combination properties was 55.28.

TABLE VI, SHOWING GROSS REVENUE PER MILE OF TRACK

Railway Only

1.	Hudson & Manhattan Railroad, New York	$191,056
2.	Interborough Rapid Transit, New York	153,923
3.	New York Railways, New York (1911)	82,426
4.	South Side Elevated, Chicago	51,991
5.	Metropolitan West Side Elevated, Chicago	51,327
6.	Toronto Railway	45,781
7.	Northwestern Elevated, Chicago	42,328
8.	Capital Traction, Washington	39,055
9.	Chicago Railways	37,897
10.	Brooklyn Rapid Transit	37,828
11.	Chicago City Railway	35,808
12.	Philadelphia Rapid Transit	33,790
13.	United Railroads of San Francisco	31,729
14.	Mexico Tramways (1911)	31,676
15.	Boston Elevated Railway	31,368
16.	Third Avenue Railway, New York	30,118
17.	Winnipeg Electric Railway	29,189
18.	Montreal Tramways	26,912
19.	United Railways of St. Louis	26,575
20.	United Traction, Albany	25,669
21.	Cleveland Railway	25,089
22.	Indianapolis Traction & Terminal	23,883
23.	International Traction, Buffalo	23,768
24.	United Railways & Electric Co., Baltimore	21,269
25.	New York State Railways, Rochester	21,009
26.	British Columbia Electric Railway	20,889
27.	Twin City Rapid Transit	20,420
28.	Louisville Railway	18,745
29.	Public Service Corporation of New Jersey	18,320
30.	Pittsburgh Railways	18,019
31.	Omaha & Council Bluffs Street Railway	17,899
32.	Los Angeles Railway Corporation	17,003
33.	Memphis Street Railway	15,498
34.	Denver City Tramway	14,994
35.	Detroit United Railway	14,749
36.	Rhode Island Company, Providence	14,812
37.	Northern Ohio Traction & Light	12,378
38.	Republic Railway & Light	12,249
39.	Cincinnati Traction, Cincinnati	11,726
40.	Connecticut Co.	10,145

Table III, giving the ratio of surplus to gross revenue, is especially interesting to the banker and to the stockholder. It appears from the figures that thirty-four companies operating railways only had an average surplus of 15.9 per cent of the gross revenue and that twenty-six companies with both railway and lighting had an average surplus of 22 per cent. This means that for each $1 taken in there was left respectively 16 cents or 22 cents for dividends and for depreciation in cases where depreciation is treated as a deduction from surplus. Low operating ratios are often counterbalanced by heavy fixed charges so that the surplus account is affected seriously, as in the case of the United Railroads of San Francisco.

Table IV shows the gross revenue per capita. The census of 1910 was used for the populations in the preparation of Tables IV, VIII and XII. Where there is more than one transportation company in a city the names of

the one or more whose gross revenues were used in this compilation appear in parentheses after the name of the city. In most cases the per capita figures cannot be given exactly because the population served is part urban and part interurban. For example, in Washington, D. C., and Atlanta, Ga., it is difficult to calculate the suburban population. Some prominent cities are omitted from this table because the gross earnings of the companies operating in

Table VII, Showing Funded Debt per Mile of Track

Railway Only

1.	Hudson & Manhattan Railroad, New York	$3,869,473
2.	Interborough Rapid Transit, New York (subway)	575,988
	Interborough Rapid Transit, New York (elevated)	345.678
3.	Northwestern Elevated, Chicago	416,666
4.	New York Railways, New York (1911)	411,662
5.	Metropolitan West Side Elevated, Chicago	261,034
6.	Third Avenue Railway, New York	231,936
7.	Chicago Railways	188,860
8.	South Side Elevated, Chicago	170,213
9.	United Railroads of San Francisco	155,243
10.	International Traction, Buffalo	149,825
11.	Brooklyn Rapid Transit	137,403
12.	United Railways & Electric Co., Baltimore	134,600
13.	United Railways of St. Louis	129,024
14.	Philadelphia Rapid Transit	126,733
15.	Indianapolis Traction & Terminal	110,428
16.	Capital Traction, Washington, D. C.	97,232
17.	Chicago City Railway	86,624
18.	Denver City Tramway	78,135
19.	Mexico Tramways (1911)	77,350
20.	Omaha & Council Bluffs Street Railway	76,037
21.	Memphis Street Railway	74,744
22.	Boston Elevated (including West End St. Ry.)	72,132
23.	Louisville Railway	65,682
24.	United Traction, Albany	65,000
25.	Montreal Tramways	62,750
26.	Pittsburgh Railways	62,213
27.	Pacific Electric Railway, Los Angeles	59,614
28.	Los Angeles Railway Corporation	54,794
29.	Rhode Island Company	48,810
30.	Twin City Rapid Transit, Minneapolis	48,514
31.	Detroit United Railway	46,845
32.	Connecticut Company	41,490
32.	British Columbia Electric Railway	40,103
34.	Winnipeg Electric Railway	38,759
35.	Cleveland Railway	37,735
36.	Toronto Railway	30,747

those cities cover both railway and lighting receipts. The figures for Chicago include the two large surface properties and the four elevated lines. The New York figures embrace all the companies doing a local service in New

Table VIII, Showing Population per Mile of Track (Approximate)

1.	Greater New York City (surface, elevated and subway)	3138
2.	Toronto	3109
3.	Milwaukee	2632
4.	Brooklyn	2561
5.	Philadelphia (Phila. R. T. Co.)	2409
6.	Public Service Corporation of New Jersey	2240
7.	Chicago (surface and elevated)	2239
8.	Albany, Troy et al	2227
9.	Cleveland	2113
10.	Montreal	2109
11.	Rochester, Syracuse et al	2000
12.	Buffalo	2000
13.	Mexico City	1691
14.	St. Joseph	1648
15.	New Orleans	1638
16.	Indianapolis	1597
17.	Columbus, Ohio	1590
18.	San Francisco	1561
19.	Washington, D. C.	1518
20.	St. Louis	1490
21.	Dallas	1439
22.	Baltimore	1385
23.	Winnipeg	1357
24.	Nashville	1345
25.	Louisville	1340
26.	Boston	1322
27.	Minneapolis and St. Paul	1309
28.	Northern Texas Electric, Fort Worth	1238
29.	Pittsburgh	1180
30.	Davenport, Rock Island and Moline	1149
31.	Seattle	1122
32.	Memphis	1048
33.	Omaha	965
34.	Birmingham	961
35.	Spokane	932
36.	Denver	931
37.	Kansas City	915
38.	Los Angeles	874
39.	Atlanta	778
40.	Salt Lake City	742
41.	Tacoma	460

York City except the Hudson & Manhattan Railroad. The average gross revenue for twenty-seven companies—railway only—was $15.85 per capita and for sixteen combination properties was $21.77, an average for the forty-three companies of $18.04.

Table V gives the relation between gross earnings and interest, the latter including rentals of leased lines. Toronto shows a relatively small bonded indebtedness ($3,658,940) and interest charge ($190,992). Cleveland has a low interest charge but a high operating ratio. The average of the other thirty-three companies on the list for railway only was $5.70, and the average for twenty-one railway and lighting companies $5.95, gross revenue per $1 of interest and rentals.

Tables VI and VII are calculated on the basis of total trackage owned and operated. There may be some errors due to the omission of leased lines. That large earnings per mile of track are not a fair criterion of the net value of a property is shown in the cases of the Hudson & Manhattan Railroad and the New York Railways. The amount

Table IX, Showing Funded Debt per $1 of Gross Earnings

Railway Only

1.	Hudson & Manhattan Railroad (including Terminal Bldg.)	$16.92
2.	Northwestern Elevated, Chicago	9.84
3.	Third Avenue Railway, New York	7.70
4.	United Railways & Electric, Baltimore	6.32
5.	International Traction, Buffalo	6.30
6.	Pacific Electric Railway, Los Angeles	6.08
7.	Denver City Tramway	5.19
8.	Metropolitan West Side Elevated, Chicago	5.08
9.	New York Railways, New York (1911)	4.99
10.	Chicago Railways	4.98
11.	United Railroads of San Francisco	4.89
12.	United Railways of St. Louis	4.85
13.	Memphis Street Railway	4.82
14.	Indianapolis Traction & Terminal	4.62
15.	Omaha & Council Bluffs Street Railway	4.24
16.	Connecticut Company	4.08
17.	Philadelphia Rapid Transit	3.75
18.	Brooklyn Rapid Transit	3.63
19.	Louisville Railway	3.51
20.	Pittsburgh Railways	3.45
21.	Rhode Island Co.	3.29
22.	South Side Elevated, Chicago	3.27
23.	Los Angeles Railway Corporation	3.22
24.	Detroit United Railway	3.18
25.	Puget Sound Electric Railway (1911)	3.17
26.	Spokane & Inland Empire	2.95
27.	Interborough Rapid Transit, New York	2.87
28.	Bay State Street Railway	2.63
29.	United Traction, Albany	2.50
30.	Capital Traction, Washington, D. C.	2.49
31.	New York State Railways	2.47
32.	Mexico Tramways (1911)	2.44
33.	Chicago City Railway	2.42
34.	Twin City Rapid Transit	2.37
35.	Montreal Tramways	2.33

Railway, Electric Light and Power

1.	Milwaukee Light, Heat & Traction	$9.04
2.	Ohio Electric Railway	5.95
3.	Union Traction Company of Indiana	5.73
4.	West Penn Traction and Water Power	5.48
5.	Public Service Corporation of New Jersey (also gas)	5.46
6.	Washington Railway & Electric Co., Washington, D. C.	5.38
7.	Portland Railway, Light & Power (also gas)	5.12
8.	New Orleans Railway & Light (also gas)	4.95
9.	Virginia Railway & Power	4.83
10.	Illinois Traction (also gas)	4.65
11.	Republic Railway & Light (also gas)	4.48
12.	Nashville Railway & Light	4.31
13.	Birmingham Railway, Light & Power (also gas)	4.15
14.	St. Joseph Railway, Light & Power	3.99
15.	Tri-City Railway & Light (also gas)	3.97
16.	Seattle Electric (1911)	3.81
17.	Public Service Corporation of New Jersey (also gas)	3.64
18.	Northern Ohio Traction & Light	3.55
19.	Kansas City Railway & Light	3.41
20.	Galveston-Houston Electric	3.34
21.	Columbus Railway & Light	3.23
22.	Dallas Electric Corporation	3.12
23.	Northern Texas Electric	3.11
24.	Terre Haute, Indianapolis & Eastern	3.10
25.	Milwaukee Electric Railway & Light Co.	2.96
26.	Georgia Railway & Electric (also gas)	2.54

of net earnings after the payment of interest charges determines the equity of the stock in the profits of the enterprise. Large revenues per mile, with low bond capitalization and interest, are shown by Toronto, Winnipeg and Albany. Some cities have a fair revenue, a rather large funded debt and a small population per mile of track, but they make creditable showings because the revenue per capita is large, owing to the riding habits of the population or to tourist traffic.

Table VII affords some interesting figures on funded debt per mile of track. The Hudson & Manhattan Railroad, as would be expected, shows the enormous cost of the undertaking, but the figure is increased because the cost of the Hudson Terminal Buildings is also included in the capitalization. The great cost of construction of the subway and elevated roads is also apparent from this table. Other factors which have affected the figures of some roads in this table are cost of changing cable traction to electricity.

Thus the Denver City Tramway Company spent between 1887 and 1890 over $10,000,000 in cable roads that were superseded by electricity partly after five years and wholly within eight years. San Francisco, Los Angeles, Kansas City and Cincinnati also changed from cable to electricity.

Table VIII shows how some of the Western roads are handicapped with a proportionately large amount of track. Omaha, Spokane, Denver, Kansas City, Los Angeles and Salt Lake City each have less than 1000 population per mile of track and, of course, are at a great disadvantage in this table when compared with New York, Chicago, Toronto, Philadelphia and other large cities.

In this table, as in all tables involving population, comparisons are not very satisfactory because it was found impracticable to adopt any consistent method of calculating population. In the case of most of the city systems the population taken was that included within the city limits, as reported by the Census Bureau, although in many, if not most, cases the railway lines extend beyond the city limits. In the case of the interurban companies the population in most instances was obtained by adding the populations of the principal secondary cities traversed by the railway and the population of the main terminal was not included, but

Table X, Showing Ratio of Net Earnings to Interest Better Than 1.50

Railway Only

1. Toronto Railway	13.50
2. Winnipeg Electric Railway	4.89
3. Capital Traction, Washington, D. C.	4.13
4. Twin City Rapid Transit, Minneapolis	3.52
5. Cleveland Railway	3.31
6. Chicago City Railway	3.09
7. British Columbia Electric Railway	3.03
8. Connecticut Company	2.88
9. Third Avenue Railway, New York	2.79
10. United Traction, Albany	2.68
11. Omaha & Council Bluffs Street Railway	2.54
12. New York State Railways, Rochester	2.50
13. Louisville Railway	2.50
14. Montreal Tramways	2.41
15. Bay State Street Railway, Boston	2.37
16. Cincinnati Traction	2.17
17. United Railways & Electric, Baltimore	2.13
18. South Side Elevated, Chicago	1.94
19. Brooklyn Rapid Transit	1.94
20. Denver City Tramway	1.90
21. Detroit United Railway	1.86
22. New York Railways, New York (1911)	1.83
23. United Railroads of San Francisco	1.73
24. Metropolitan Elevated, Chicago	1.72
25. Los Angeles Railway Corporation	1.71
26. Rhode Island Company, Providence, R. I.	1.65
27. Interborough Rapid Transit, New York	1.65
28. United Railways of St. Louis	1.64
29. Chicago Railways	1.54

Railway, Electric Light and Power

1. Washington Water Power, Spokane	5.93
2. Utah Light & Railway	5.30
3. Milwaukee Electric Railway & Light	3.85
4. Georgia Railway & Electric (also gas)	3.58
5. Northern Texas Electric, Fort Worth-Dallas	3.44
6. Dallas Electric Corporation	3.19
7. Northern Ohio Traction & Light	2.47
8. Kansas City Railway & Light	2.44
9. Galveston-Houston Electric	2.42
10. St. Joseph Railway, Light, Heat & Power	2.39
11. Tri-City Railway & Light (also gas)	2.29
12. Nashville Railway & Light	2.03
13. Birmingham Railway, Light & Power (also gas)	2.03
14. Republic Railway & Light (also gas)	2.00
15. Seattle Electric (1911)	1.98
16. West Penn Traction & Water Power	1.98
17. New Orleans Railway & Electric (also gas)	1.98
18. Virginia Railway & Power	1.91
19. Washington Railway & Electric, Washington, D. C.	1.88
20. Portland Railway, Light & Power, Portland, Ore. (also gas)	1.88
21. Terre Haute, Indianapolis & Eastern	1.73
22. Illinois Traction (also gas)	1.54

exceptions were made when circumstances appeared to warrant them. Hence another compiler might reach conclusions quite different from those shown in all of the accompanying tables which involve population.

Table IX shows that, exclusive of the Hudson & Manhattan Railroad, thirty-four railway companies averaged $4.12 funded debt for every $1 of gross earnings and that twenty-six railway and lighting companies similarly averaged $4.34. In other words, it required more than $4 of funded debt to take in $1, and out of the $1 must first be paid interest of 20 cents to 25 cents, depending upon the marketability of the bonds.

Table X gives for twenty-eight railways, exclusive of Toronto, an average of $2.43 net revenue for every $1 of interest and rentals and an average similarly of $2.64 for twenty-two railway and lighting companies.

Table XI contains interesting data on total capitalization. The difference between the figures in Table XI and Table IX gives the stock outstanding per $1 of gross revenue. The average total capitalization per $1 of gross was for forty-one railways $7.64 and for twenty-seven railway and lighting companies $8.24. Deducting the figures obtained from Table IX of $4.12 and $4.34 for funded debt for $1 gross, there remain for the outstanding stock, per $1 of gross, $3.52 for railways and $3.90 for combined properties. For sixteen railways and nineteen railway and lighting companies the preferred stock averages $1.17 and $1.32 respectively per $1 of gross earnings. If the above averages hold good for the companies considered,

Table XI, Showing Total Capitalization per $1 of Gross Revenue

Railway Only

1. Hudson & Manhattan Railroad, New York (inc. Terminal Bldg.)	$32.71
2. Pacific Electric Railway, Los Angeles	14.98
3. Northwestern Elevated, Chicago	13.56
4. Spokane & Inland Empire	13.00
5. Connecticut Company	11.17
6. Pittsburgh Railways	10.53
7. Metropolitan Elevated, Chicago	10.51
8. United Railroads of San Francisco	9.96
9. Third Avenue Railway, New York	9.53
10. International Traction, Buffalo	8.64
11. United Railways of St. Louis	8.52
12. Omaha & Council Bluffs Street Railway	8.46
13. United Railways & Electric, Baltimore	8.18
14. Capital Traction, Washington, D. C.	7.78
15. South Side Elevated, Chicago	7.46
16. Memphis Street Railway	7.40
17. United Traction, Albany	7.32
18. Rhode Island Company	7.09
19. Denver City Tramway	6.98
20. New York Railways, New York (1911)	6.79
21. Los Angeles Railway Corporation	6.44
22. Louisville Railway	6.30
23. Indianapolis Traction & Terminal	5.94
24. Interborough Rapid Transit	5.91
25. Puget Sound Electric Railway (1911)	5.73
26. Mexico Tramways (1911)	5.68
27. New York State Railways, Rochester	5.67
28. Brooklyn Rapid Transit	5.56
29. Bay State Street Railway	5.21
30. Twin City Rapid Transit	5.19
31. Montreal Tramways	5.15
32. Philadelphia Rapid Transit	5.13
33. Chicago Railways	4.98
34. Boston Elevated Railway	4.74
35. Winnipeg Electric Railway	4.36
36. British Columbia Electric Railway	4.35
37. Detroit United Railway	4.25
38. Cincinnati Traction	4.13
39. Chicago City Railway	4.02
40. Cleveland Railway	3.77
41. Toronto Railway	2.69
Average	7.64

Railway, Electric Light and Power

1. Milwaukee Light, Heat & Traction	$17.12
2. West Penn Traction & Water Power	14.69
3. Ohio Electric Railway	13.34
4. Terre Haute, Indianapolis & Eastern	10.65
5. Union Traction Company of Indiana	9.63
6. Virginia Railway & Power	9.50
7. New Orleans Railway & Light (also gas)	9.49
8. Portland Railway, Light & Power (also gas)	8.88
9. Republic Railway & Light, Youngstown, Ohio (also gas)	8.76
10. Washington Railway & Electric	8.67
11. St. Joseph Railway & Light	8.28
12. Columbus Railway & Light	8.08
13. Public Service Corporation of New Jersey (also gas)	8.04
14. Tri-City Railway & Light (also gas)	7.86
15. Dallas Electric Corporation	7.86
16. Nashville Railway & Light	7.44
17. Northern Ohio Traction & Light	7.20
18. Illinois Traction Company (also gas)	7.08
19. Northern Texas Electric	6.74
20. Birmingham Railway, Light & Power (also gas)	6.48
21. Galveston-Houston Electric	6.28
22. Seattle Electric (1911)	6.28
23. Washington Water Power, Spokane	6.21
24. Kansas City Railway & Light	5.67
25. Milwaukee Electric Railway & Light	5.49
26. Georgia Railway & Electric (also gas)	4.74
27. Utah Light & Railway	4.07
Average	8.24

the common stock would average per $1 of gross about $2.35 for railways and $2.58 for combination properties. If the preferred stock be added to the funded debt and dividends on it be figured at 5 per cent, there is a total interest and preferred dividend charge of from 26 to 28 cents for each $1 earned.

Table XII has figures of the total capitalization per capita. For sixteen railway companies selected where preferred stock is reported and population known approximately, the figures shown in Table XIII appear.

TABLE XII, SHOWING TOTAL CAPITALIZATION PER CAPITA

Railway Only

		(Approximate)
1.	United Railroads of San Francisco	$202
2.	Washington, D. C., combined companies	174
3.	Pittsburgh Railways	161
4.	Omaha & Council Bluffs Street Railway	157
5.	United Railways of St. Louis	152
6.	United Railways & Electric, Baltimore	125
7.	Los Angeles Railway Corporation	125
8.	Denver City Tramway	112
9.	Boston Elevated Railway	112
10.	New York City, combined companies. (See text)	111
11.	International Traction, Buffalo	110
12.	Memphis Street Railway	109
13.	Chicago, combined companies. (See text)	108
14.	Mexico Tramways (1911)	106
15.	Puget Sound Electric Railway (1911)	102
16.	Winnipeg Electric Railway	94
17.	Indianapolis Traction & Terminal	87
18.	United Traction, Albany	84
19.	Louisville Railway	84
20.	Detroit United Railway	83
21.	Twin City Rapid Transit	81
22.	Brooklyn Rapid Transit	79
23.	Philadelphia Rapid Transit	72
24.	Montreal Tramways	66
25.	New York State Railways	61
26.	Cincinnati Traction	58
27.	Cleveland Railway	45
28.	Toronto Railway	39

Railway, Electric Light and Power

1.	Tri-City Railway & Light (also gas)	$243
2.	Kansas City Railway & Light	191
3.	Washington Water Power, Spokane	188
4.	New Orleans Railway & Light (also gas)	185
5.	Dallas Electric Corporation	155
6.	Georgia Railway & Electric (also gas)	152
7.	Birmingham Railway, Light & Power (also gas)	146
8.	Nashville Railway & Light	140
9.	Public Service Corporation of New Jersey	129
10.	St. Joseph Railway, Light, Heat & Power	126
11.	Seattle Electric (1911)	124
12.	Utah Light & Railway	114
13.	Columbus Railway & Light	112
14.	Republic Railway & Light (also gas)	108
15.	West Penn Traction & Water Power	100
16.	Galveston-Houston Electric	86
17.	Milwaukee Electric Railway & Light	83
18.	Northern Ohio Traction & Light	72
19.	Northern Texas Electric	53

TABLE XIII—SHOWING CAPITALIZATION, EARNINGS, ETC., FOR SIXTEEN RAILWAY COMPANIES

		Per Cent	Per Capita	Per $1 Gross
Approximate population served	3,760,498	..	.....	.....
Capitalization	$757,785,703	100	$79.40	$7.07
Funded debt	369,447,363	48	38.71	3.45
Preferred stock	125,223,880	17	13.12	1.17
Common stock	263,114,460	35	27.57	2.45
Gross earnings	107,142,195	..	11.22	.....
Net	40,513,091	..	4.24	0.38

Operating ratio, 62.19.

The following are the companies taken for Table XIII: United Railroads of San Francisco; Metropolitan Elevated, Chicago; Northwestern Elevated, Chicago; Louisville Railway; Bay State Street Railway, Boston; Boston Elevated Railway; Twin City Rapid Transit; United Railways of St. Louis; Omaha & Council Bluffs Street Railway; New York State Railways, Rochester; International Traction of Buffalo; Cincinnati Traction; Pittsburgh Railways; Memphis Street Railway; Montreal Tramways, and Winnipeg Electric Railway.

The corresponding statistics for eighteen combined railway and lighting companies are shown in Table XIV. The following companies were included in Table XIV: Birmingham Railway & Light; Washington Railway & Electric; Georgia Railway & Electric; Tri-City Railway & Light, of Davenport, Rock Island and Moline; New Orleans Railway & Light; Kansas City Railway & Light; St. Joseph Railway, Light, Heat & Power; Republic Railway & Light, of Youngstown, Ohio; Northern Ohio Traction & Light; West Penn Traction & Water Power; Nashville Railway & Light; Dallas Electric Corporation; Galveston-Houston Electric; Northern Texas Electric; Utah Light & Railway; Puget Sound Electric Railway; Seattle Electric, and Milwaukee Electric Railway & Light.

TABLE XIV—SHOWING CAPITALIZATION, EARNINGS, ETC., FOR EIGHTEEN COMBINED RAILWAY AND LIGHTING COMPANIES.

		Per Cent	Per Capita	Per $1 Gross
Approximate population served	3,760,498	..	.....	.....
Capitalization	$463,531,134	100	$123.27	$7.22
Funded debt	244,809,669	53	65.10	3.81
Preferred stock	84,543,135	19	22.49	1.32
Common stock	134,178,330	28	35.68	2.09
Gross earnings	64,115,954	..	17.95	.....
Net	28,543,052	..	7.59	0.44

Operating ratio, 55.41.

If 5 per cent should be allowed as the interest on the funded debt and 6 per cent on preferred stock, the annual per capita tax or "readiness to serve" was $2.72 in the case of the sixteen railways and $4.60 for the eighteen combination properties, leaving an annual per capita contribution toward sinking fund, depreciation and dividends on common stock of $1.52 and $2.99 respectively, equivalent to 5.5 per cent and 8.3 per cent on common stock respectively. The gross contribution per day per capita was about 3 cents and 4.9 cents respectively.

CONCLUSION

Table XV shows certain approximate averages, derived from the tables made upon the basis of each $1 gross revenue.

TABLE XV—SHOWING AVERAGES BASED UPON EACH $1 GROSS REVENUE

Railways		Per Cent of Gross	Per Cent of Net
Gross revenue	$1.00	..	..
Operating expenses	0.59	59	..
Net earnings	0.41	41	..
Taxes and interest	0.25	25	60
Surplus	0.16	16	40
Railway and Electric Lighting			
Gross earnings	$1.00	..	..
Operating expense	0.55	55	..
Net earnings	0.45	45	..
Taxes and interest	0.23	23	51
Surplus	0.22	22	49

JOINT RUBBER INSULATION COMMITTEE

A conference of manufacturers and users of rubber insulation was held in New York on Oct. 15 to consider a standard set of specifications for rubber insulated wire and cables and an analytical procedure for rubber insulating pounds, and a report embodying these specifications and such a procedure was adopted. The following interests participated: United States Signal Corps, United States Bureau of Standards, American Chemical Society, New York Central Lines, Pennsylvania Railroad, General Electric Company, Hazard Manufacturing Company, Lederle Laboratories, Simplex Wire & Cable Company, Standard Underground Cable Company.

The meeting was the result of a previous conference, held Dec. 7, 1911, upon invitation of E. B. Katté, of the New York Central & Hudson River Railroad, at which a committee was appointed to draw up specifications and procedure of the kind mentioned. At this earlier meeting Major S. Reber, United States Signal Corps, was elected chairman and a committee to prepare the specifications was appointed.

This committee has been at work for about two years and has just completed a preliminary report containing a specification for 30 per cent Para compound and an analytical procedure which is to be put in use for one year, at the end of which period a final report will be issued. It was this preliminary reort which was presented at the conference on Oct. 15, Major S. Reber again presiding, and it was accepted. Major Reber, Mr. Katté and other speakers paid high tribute to the excellence of the committee's work and said that they would recommend that the specification and analytical procedure should be put into use by their respective organizations. The committee was authorized to make arrangements for the publication of its report.

It is of interest to note that the committees of the American Electric Railway Engineering Association and the Association of Railway Electrical Engineers have accepted the recommendations of this report as standard and have so reported to their respective associations. It is the intention of the joint rubber insulation committee to urge the acceptance of the report by other national societies, to the end that the manufacturers shall have to work to only one specification for 30 per cent Para compounds, a result that would bring considerable economies to the manufacturers and corresponding gain to the consumers.

Mr. Dalrymple's Impressions of His Visit

After a Tour of the Country, Concluding with the Atlantic City Convention, the Manager of the Glasgow Corporation Tramways Returns to His Home—His Views on Our Conditions

James Dalrymple, manager Glasgow Corporation Tramways, sailed from New York for home on the steamship *Caronia* on Oct. 18, after a general tour of the country lasting a little more than two months.

Mr. Dalrymple arrived in New York on Aug. 16 and during his stay in this country visited Boston, Buffalo, Cleveland, Detroit, Chicago, Milwaukee, Minneapolis and St. Paul, Duluth, Seattle, Tacoma, Portland, San Francisco, Los Angeles, Oakland, Berkeley, Denver, Kansas City, St. Louis, Pittsburgh, Washington, Philadelphia and Atlantic City, where he attended the convention of the American Electric Railway Association. On his trip westward he also stopped at Winnipeg and Vancouver. He was accompanied by Thomas Nisbet, master of works of the city of Glasgow. The main object of their trip was to see various types of lift bridges in use throughout the United States, but the trip also offered opportunities for the inspection of street railway systems. Glasgow is considering the question of building a number of bridges over the River Clyde, and it was desired to obtain definite information regarding the operation of different types of bridges in this country. The visitors improved the opportunity for inspecting a number of different styles of bridges in service, so that the main object of the trip was successful.

Before he sailed Mr. Dalrymple gave some impressions of his visit to a representative of the Electric Railway Journal. He said that in every city he visited he was put in touch with the officials of the street railway system. Wherever possible he also got into contact with the municipal authorities. He had not been in this country for eight years previous to this visit and had never been so far west before. So far as the cities which he visited on his previous trip were concerned, he said there was no doubt that in many respects there had been a great advance in street railway operation. When he was here before the first thing that struck him was the general untidiness of the cars in comparison with those operated in Glasgow. He said that in Glasgow every endeavor was made to keep the cars in as nearly perfect condition as possible, in respect both to maintenance and to cleanliness. He believes now that the condition in respect to untidiness which he noted on his previous visit has very much changed here. The rolling stock, he found, was well maintained and in very much better condition than before. Generally speaking, however, the cars were not so bright in appearance in this country as on the other side of the ocean. On account of the prevailing fogs, there is a good deal of gloominess about the appearance of the city of Glasgow, and to overcome this as far as possible an effort is made to keep the cars bright in appearance. For instance, the cars are painted bright blues, greens, reds, etc. No one standard color is followed for all cars, but those of different lines are painted identifying colors.

Mr. Dalrymple said there is no doubt that the prepayment system is the ideal one for conditions existing here with the uniform fare. He would like very much to be able to see a way whereby it would be possible to keep conductors on the platforms in his own city, because of the advantage that it would carry in the reduction and prevention of accidents. A way to do this, however, has not yet been discovered owing to the difference in conditions of operation in Glasgow. So far as his experience went, he thought that the trainmen seemed to be all right here, but he did not know that they were so anxious to accommodate as those on the lines in Glasgow. The conductors here have very much easier jobs than those employed on the Glasgow lines, because of the simplicity of the collection of fares here.

Mr. Dalrymple said he thought that the street railways would not be in proper shape here until they could reduce overcrowding. He noticed overcrowding in almost every city he visited. He said that in Glasgow the lines were carrying as many people, and no person was allowed to stand, yet there was practically no waiting for cars.

When questioned as to the acuteness of the rush-hour traffic in Glasgow, as compared with the normal traffic throughout the day, Mr. Dalrymple said that the difference was not so great as in this country. This lessens the problem of caring for the rush-hour travel there.

"Of course," he said, "we have rush-hour traffic as every other city has, but the fact that there is not such a great difference between the rush-hour and the slack hours as in the cities of the United States is due mainly to our very low fare and the circumstance that our cars are pretty well filled continually, so that part of the traffic is taken out of the way before the rush hour begins." Mr. Dalrymple said that he had seen cars in some of the cities here carrying very few passengers during the middle of the day and that such a condition did not exist in Glasgow.

The Glasgow lines recently doubled the distance of possible travel for 1 cent, and they give now a ride of 1¼ miles for this rate of fare. The object of this change was to induce people to ride during the slack hours, and it has been effective in inducing a great many to ride who would have walked under previous conditions. The total number of passengers carried yearly before this change was made was 230,000,000. Immediately after the change was made the traffic increased to the rate of 320,000,000 passengers annually, and this has continued without diminution. The additional traffic was carried with very few extra cars, yet there was no overcrowding, Mr. Dalrymple said.

The visitor added that, generally speaking, the condition of track was not so good here as on the other side. Tracks in the Far West, however, were, generally speaking, better than in the East. The condition of the track was good in almost every city that he visited in the West. In some cities in the country, however, he found that the cars were being operated on very bad tracks, which must have a bad effect on the rolling stock. Throughout the country the overhead seemed to be in good condition. He mentioned specially the fine shops in Minneapolis and several other cities and a good carhouse in Philadelphia. A great many of the companies were still using old shops, he noticed, but there seemed to be a general movement in all sections of the country to improve both shops and carhouses.

One matter on which Mr. Dalrymple commented was the size of cars. He said that the Glasgow cars require less room on the streets. It is important in that city for the cars to take up as little room as possible. The standard cars are not much over one-half as long as the larger types of cars here. He noted that the fenders here project from the cars and that adds to the street space required by the cars.

The visitor said that he would like to see the double-deck cars adopted more generally. He liked those he saw both in Pittsburgh and New York. He believes in a light type of construction for cars, taking into account stability at the same time. He rode on the near-side cars in Philadelphia, but happened to do so at the non-rush hours and had no opportunity to see the effect of their operation during the rush-hour period.

A one-man car is operated on one short route in Glasgow where there is a small revenue, and it has worked satisfactorily for that purpose. Mr. Dalrymple favors the use of such a car for conditions like those that exist on that route, where the traffic is light and there is no need whatever for the presence of a conductor. In cases like that, he said, the service must be rendered as cheaply as possible if it is to be furnished at all.

Commenting on the state of public relations in this country, Mr. Dalrymple observed that there seemed to be a general feeling of unrest over the questions at issue between the companies and the public. "On account of this unrest, the companies do not seem to know what is before them," he added, "and that is a very unsatisfactory condition of affairs."

Continuing, the Glasgow manager said he had no doubt that where the conditions of co-operation and relations between the company and the people were not as they should be the people were apt to demand unreasonable things. If that condition grew, the companies could not operate with success, and the only thing to do was to let the city take the underakings over. He thought that it would come to that in the end, anyway.

In speaking of the question of wages, Mr. Dalrymple said that he had gone into it to a very limited extent, but that the wages here generally were very much higher than on the other side of the ocean. He was especially impressed by the difference as he went farther west in his travels. He found that the wages in Glasgow were about one-half of what they were in the Western cities in this country. However, conditions as to wages were not comparable, because, he said, the wages of employees in Glasgow compared with the scale of wages prevailing in that country were high.

Mr. Dalrymple was very much interested in the exhibit presented by the manufacturers in connection with the annual meeting of the American Electric Railway Association at Atlantic City. He said that he had never seen one of the kind before. He was surprised to note that the supply men did not seem to spare any work and expense in getting up the exhibit. It was far better than anything he had anticipated.

Mr. Dalrymple was asked about the graded fare system, and he expressed himself as believing that that is the fairest system in existence. He declared that it would be exceedingly interesting if some company in this country should be bold enough to make an experiment with graded fares on a city line. Speaking further about the recent change whereby the ride available for the small fare in Glasgow was doubled, he said that it had been calculated that some revenue would be dropped provided there was no additional traffic to be handled. The result of the change, however, was that the system carried an additional number of passengers that made up the deficit due to the reduction in fare, and within two years the gross revenue was greater than before the change was made. At the same time the change was absorbed in the finances without any serious effect on the net revenue. The net profit was less after the change was made and established, but that was not the result of the lower fare. It was due to other causes not related to that change.

In reference to his visit in Chicago, Mr. Dalrymple said he was perfectly satisfied that the opinion he formed eight years ago in regard to the Chicago situation was correct.

[The opinion to which Mr. Dalrymple refers was written to Mayor Dunne of Chicago and was published in the Street Railway Journal of March 17, 1906. It was in part as follows: "There would undoubtedly be grave danger in your [city] attempting to operate what would be the largest street railway undertaking in the world without making a very radical change in the methods usually employed in carrying on municipal work by the cities of the United States. I should be very sorry were you forced to take such a step, as, speaking generally, I should say, from my knowledge and experience of what it means to operate a municipal street railway system, that the municipalities of the United States are not yet quite ready to successfully undertake this work."—Eds.]

Mr. Dalrymple added that, so far as he could see, the systems in Chicago were operated with perfect smoothness now and there was no doubt that there had been an enormous improvement in their condition during the last eight years.

In reference to the subject of municipal ownership, Mr. Dalrymple said that if the municipalities were going to take over street railway systems here, they must run such properties according to the methods followed on the other side of the ocean. The executive officials must have security in office, and changes of administration must have no effect on the operation or the personnel of the street railway system. Otherwise, the result would be that the municipalities would land themselves in confusion.

In concluding his statement, Mr. Dalrymple said he wanted to make it plain that both Mr. Nisbet and himself were very well received, got all the information they could possibly expect to get and enjoyed their sojourn in the United States very much. All the people with whom they came in contact seemed anxious to give them all the information that could be desired on the subjects they had in mind.

NIAGARA POWER ON THE BEEBE LINES

Since last December the Rochester, Syracuse & Eastern, the Syracuse, Lake Shore & Northern, the Syracuse & South Bay, the Auburn & Syracuse, the Auburn & Northern and the Syracuse, Watertown & St. Lawrence River Railways have been supplied with power by the Niagara Falls, Lockport & Ontario Power Company. The power company's lines connect with those of the railway companies at the Lyons steam station and at the Solvay substation near Syracuse. Power is transformed at sixteen substations distributed over the lines of the railway companies.

The power company's load now taxes its maximum capacity from Niagara, and during 1913 its source of supply will be augmented by a new hydroelectric station which is under construction near Altmar on the Salmon River, 40 miles west of Syracuse.

The power company has purchased the steam plants of the railway companies at Lyons and Auburn and is operating them as supplementary plants. The Auburn plant is a 2000-hp Corliss-engine plant, not modern, and it is operated for but a few hours per day to help out at times of peak load. The building, however, houses rotary converters for the supply of local railway current. The Lyons plant is modern, having been built in 1906. The plant has a capacity of 6500 kw in three units, two of 1500 kw each and one of 3500 kw. These units are Westinghouse turbo-alternators, two-phase, 3300 volts, twenty-five cycles. The two-phase current was originally selected with the possibility of using single-phase motors, for which it is more suitable than three-phase.

The transformers are eight in number, of 650 kw capacity each, and all are T-connected to transform from two-phase to three-phase and to raise the voltage to 33,000, three-phase. In the plant are rotary converters from which the local railway lines are supplied. These rotaries are owned and maintained by the railway companies, but the power company's employees operate them.

In taking over the steam plants the power company gains a reserve and is able to carry the peak loads originating within a considerable range. This reserve it has not had heretofore. The company also gains the ability to operate the steam plant as a synchronous condenser plant if it desires to increase the line power factor.

Pennsylvania Railroad "Safety First" Exhibit

More Than Four Thousand Employees Visit Exhibition Held in Pennsylvania Terminal, New York, Under Auspices of the Manhattan Division Safety Committee

To reduce the number of accidents to its employees, the Pennsylvania Railroad recently made a "Safety First" exhibition at its New York station. Most of the exhibits related to the company's Manhattan Division and hence were of an electric railway character. During part of the time of its continuance the exhibit was open in the evening to allow the day employees to attend. It is estimated that between 2000 and 2500 employees and officers, representing almost every department of the railroad service, studied the exhibit on the opening day, Sept. 26. So many others desired to attend, however, that it was necessary to continue for a week, during which time there were 4000 visitors, mostly employees.

The articles shown, which occupied three large rooms, were numerous, varying from a rusty nail to a whole section of track. Of more than sixty exhibits the most interesting were the following: a section of track; a miniature telegraph line; various machine tools guarded and unguarded; an old-style set screw and a hollow set screw which has taken its place; boards showing protruding nails; good and bad jumpers; unprotected and protected station platforms; ropes and chains, perfect and defective; marker lamps in good and bad condition; barrels and boxes of freight properly and improperly piled on floor and on hand trucks; a fire alarm apparatus for station and tunnels; safe and unsafe heavy lamp shade supports; a switch and rheostat with live parts protected; safe and unsafe devices for operating baggage elevators; brake hose, perfect and imperfect; a miniature power plant for demonstrating different electrical devices, and hundreds of photographs illustrating safe and unsafe methods of working on cars, tracks, etc.

Not only were the various safety appliances attached to the different kinds of equipment exhibited open to the thorough inspection of those who attended, but there were demonstrators present to show and to explain the right and wrong methods of handling machinery, tools, etc. At the evening sessions practical demonstrations by employees of first aid to the injured were the most interesting features. For example, there was an exhibition in resuscitation from electric shock. The increasing use of electricity about the shops, stations and all other property of the Pennsylvania Railroad makes it necessary that employees be qualified to render intelligent assistance in case of electrical accident. To this end employees are instructed, first, in the safe removal of the victim from contact with live wires and third-rails; second, in the approved method of resuscitating persons apparently dead from electric shock, and third, in the care of the victim when natural respiration has been restored.

The demonstration of electric shock, as given in the company's auditorium during the exhibition, was quite realistic, as may be judged by the accompanying illustrations. The scene showed a laborer walking along the tracks. Observing a tool on one of the ties, he stooped down to remove it. Losing his balance, he fell, accidentally touching the third-rail with his hand, with the result that he was apparently electrocuted. On hearing his cry two fellow workmen hastened to his side and after procuring rubber gloves pulled him away from the rail.

Immediately one of the rescuers opened the victim's mouth to remove therefrom a set of false teeth. Then, quickly laying the apparently dead man on his stomach, with arms extended forward and face turned to one side so as to permit free breathing, one of the men proceeded to apply what is known as the Shaefer method of artificial respiration. The other ran to an emergency telephone located near the tracks to summon the railroad surgeon, who, upon arrival, took charge of the operations. After the victim regained consciousness the physician administered stimulants—which employees are forbidden to do—and the man was carried out on a stretcher.

Another interesting and educational exhibition was that in which employees illustrated the treatment for hemorrhage, fracture, burns, shock, unconsciousness, fits, heat exhaustion and sunstroke. The Pennsylvania standard "first aid packet," which may be found in stations, telegraph towers, yard buildings, tool houses and on trains, played an important part in these demonstrations. The "first aid packet" is a sanitary tin box containing two aseptic compresses wrapped in oiled paper, one cambric bandage, one triangular bandage and two safety pins.

Pennsylvania "Safety First" Exhibit—Victim Being Resuscitated from Electric Shock—Employees Demonstrating Treatment for Burns, Bruises, Etc.

Several booklets issued by the Pennsylvania Railroad for the benefit of the employees were distributed. Some of them were: "Safety Hints and Suggestions for the Prevention of Personal Injury Accidents"; "Precautionary Measures for the Prevention of Accidents at Freight Stations"; "Instructions for the Guidance and Protection of Employees" (in English, Italian and Polish); "Hints on First Aid to the Injured," and "Courtesy."

The pamphlet entitled "Safety Hints and Suggestions for the Prevention of Personal Injury Accidents" contains valuable information in regard to general road and yard conditions, including right-of-way and structures, operation, electricity, transportation, sanitation, hygiene, first aid and trespassing, and also in regard to shop conditions

and safety precautions. The booklet regarding precautionary measures at freight stations contains a chapter on resuscitation from electric shock, a reprint by permission of the National Electric Light Association, together with pictures showing the proper positions taken to induce inspiration and expiration.

The walls of the exhibition room were well covered with placards, some of the most striking of which read as follows:

"The path of duty is the path of safety."

"What are you going to do to cut down the number of accident reports?"

"After going home to-night read over your book of rules and special instructions."

"Your failure to examine the bulletin board and understand orders posted thereon before going on duty may result in an accident."

Pennsylvania "Safety First" Exhibit—Employees Removing Victim from Contact with Third-Rail

"The mere installation of safeguards will not necessarily prevent accidents; see to it that the machinery is never operated without the safeguards being in place."

"On May 8, 1913, a man was severely injured owing to using a file without a handle."

The Manhattan Division safety committee, under whose direction the exhibit was given, is composed as follows: L. J. Griffith, foreman of substations and transportation, chairman; O. E. Proud, chief operator; P. C. Bauman, assistant medical examiner; A. W. Reynolds, general foreman of carpenters and painters; E. T. Otis, station electrician; F. C. Rutledge, inspector, and W. F. Dolan, assistant foreman of transportation.

In commemoration of the fourteenth biennial meeting of the German Street & Interurban Railway Association, which was held at Cologne on Sept. 3, 4 and 5, a handsome railway souvenir of that city was presented to the delegates by the municipality. The book, which embraces 235 pages, with many illustrations and maps, was prepared by Dr. Kaiser, director of the Cologne municipal street railways. It gives a complete historical review from horse car days and describes the present system in every department. The comparison of the first year of municipal operation, 1901, with 1912 shows the following results: Miles of track, 34.7 and 49.2; car miles, 4,138,626 and 16,049,078; passengers carried, 30,970,673 and 115,875,360; gross earnings, $801,351 and $2,499,000; earnings per car mile, 19.2 cents and 15.2 cents; gross earnings per passenger carried, 2.57 cents and 2.15 cents; operating expenses per car mile, 11.8 cents and 9.76 cents.

TESTS OF TWO-CAR TRAINS IN CITY SERVICE

R. E. Danforth, general manager Public Service Railway, of New Jersey, has announced that that company has arranged for a new series of tests of two-car train operation in Newark and Jersey City. These are to be carried out as an amplification of the tests which were conducted during the last winter and were reported in abstract in the Electric Railway Journal for June 5, 1913. The method of conducting the tests will be based upon the experience gained at the time of the previous tests as well as the facts which were brought to light by the results of these tests.

One of the tests will be run on the Greenville line between Jersey City and Bayonne. Tests will also be conducted in Newark on the Broad Street line, one of the most important lines in that city, and probably on one of the other lines. These tests will be so arranged as to overcome the two main conditions which were found, in the original tests, to introduce elements of confusion in the final results. The first and most important of these elements is the lack of familiarity with train operation which existed during the original tests, not only on the part of the train crews but also on the part of the public. This, it is believed, constituted a serious handicap to rapid operation of the two-car units, as the conductors were not accustomed to the double transmission of signals and the boarding passengers were found to hesitate in selecting between the two entrances offered to them. These opportunities for delay to the trains will not exist on the Greenville line as trains have been in daily use there since 1911.

The other indeterminate factor which it is planned to eliminate in the new tests is that of mixed service. In the original tests the trains had to be sandwiched in between the single cars which constituted the normal service, and as a consequence any conclusions regarding schedule speed or the number of trains required to do the work of transportation had to be based upon calculations instead of showing directly in the results. In the new tests it is planned to operate the whole line in each case exclusively with two-car trains for one week, keeping track of the number of cars, the number of platform men, the total power consumption, the rush-hour round-trip time, the time consumed in stops, the number of stops, the number of standing passengers and the like. During the following week the trains will be replaced by single cars for which the same observations will be taken, the number of cars being adjusted to give similar rush-hour loading conditions, so that when the tests are completed a direct comparison between the costs of the two methods of operation will show directly from the results. Possibly instead of running the entire service all day in this way for an entire week, certain weekdays of each week will be selected for operation with single cars during the non-rush hours and the other days of the week for operation with trains throughout the day.

The Greenville line on which the first test will be conducted is typical of city traffic conditions, as the line is of moderate length and picks up or discharges passengers along the entire route. The round trip at present on this line, including lay-overs at both ends, now requires 110 minutes, and the length is 16.45 miles. Exclusive of lay-overs the schedule speed is 9.31 m.p.h.

The fact that two-car trains have been in use on the Greenville line since 1911 makes it a particularly appropriate one for the tests, because the patrons on this line have been used to that class of service. At present the trains are used only in the rush hours, the rest of the service being with single motor cars. The present schedule (that in October) calls for twenty-eight motor cars during the middle of the day and thirty-seven single motor cars and fourteen two-car trains during the rush hours. This corresponds to a headway of one and two-thirds minutes at

night, two minutes in the morning and four minutes in the middle of the day. The winter schedule calls for ten more units. The trains are made up of two former single-unit motor cars, each with a 25-ft. body. Each of these cars is equipped with two motors. The cars are permanently coupled together and are operated by means of a four-motor controller. The front car has a forward exit and a rear entrance and exit. The rear car has an entrance and exit at the rear but the front platform is closed up. The single-motor cars used on this line have a 32-ft. body so that the two-car train has 100 ft. of seats as compared with 64 ft. of seats in the single car. All of the single cars used on this line are four-motor cars, as a considerable part of the line is in a trucking district and it was impracticable to get sufficient adhesion for good acceleration with a single two-motor car. The two-car train with four motors seems to have better traction than the single two-motor cars. Of course, during the hours when the service will be supplied by single cars only enough additional cars will be run to make the service in each case the same.

To make the loading conditions as nearly equal as possible, the company in the tests in Newark will change the entrance arrangements of the second car in the train so as to have the entrance at the front end of the car and will close up the rear end of the car. As the entrance to the first car of the train is at the rear of the car, this arrangement will bring both entrances together and will reduce any time lost by passengers going first to one entrance and then the length of the car to the other. In other words, the train will be a center-entrance train but with no connection between the cars. It is expected that in the tests in the city of Newark on Broad Street and on the other line selected the arrangements in regard to the running of trains, etc., will be similar to those described in the Greenville tests.

The company hopes by means of these new tests to settle satisfactorily the question of the economy of train operation as applied to conditions such as exist in the city of Newark and its vicinity. The tests are to be made under winter conditions, if that is found necessary, but it is expected that a series of preliminary tests will be run off on the Greenville line early in November.

INTERLOCKING RULES ADOPTED IN WISCONSIN

For several years past the Railroad Commission of Wisconsin has been working in conjunction with the Railroad and Warehouse Commission of Illinois, the Railroad and Warehouse Commission of Minnesota and the Public Service Commission of Indiana for a uniform set of rules governing the construction, maintenance and operation of interlocking plants on steam and electric railways. Several conferences have been held at various times at which have been present the signal engineers of practically all the railroads interested in signaling in these four states and at which the representation has been estimated to include one-third of the total mileage of steam railroads as well as a large share of the mileage of electric railways in the United States. The engineers of the commissions have held several conferences independently of those held with the signal engineers of the railroads, and as a result a set of rules has been prepared which the engineers of these four state commissions have agreed upon for submission to their respective commissions for adoption. Accordingly these rules were submitted to the Wisconsin commission and, after a public hearing, were adopted on Oct. 8, to become effective Dec. 1, 1913. A brief abstract of the rules is submitted herewith.

Prior to the construction, reconstruction or rehabilitation of any interlocking plant, there shall be filed with the commission as a basis for approval a station map or other plat drawn to scale showing all physical surroundings located on the right-of-way of each company, profiles showing the grade of each railroad company's main tracks for a distance of not less than 2 miles in each direction from the crossing or junction, and a track plan in duplicate showing the location of all interlocking units, the tower and its general dimensions, and any other appurtenances necessary to show a complete layout of the proposed interlocking plant. All plans must be of light-weight paper when in the form of blueprints. In the preparation of plans the symbols approved by the Railway Signal Association shall be used to indicate essential parts of the interlocking plant.

The interlocking limits are defined by the home or dwarf signals situate on any specified track and located farthest from the point to be protected. Any appliances operated in conjunction with the interlocking plant and situated beyond the limits designated are considered as auxiliaries.

The commission's approval on such plans will stand for a period of one year. If the work is not commenced within that period, a new approval must be obtained. No interlocking plant shall be reconstructed or rehabilitated, nor shall any change be made in the locking or in the location of any unit until plans have first been submitted to and approved by the commission.

Upon the completion of any work on an interlocking plant which involves changes in the locking, the units must be connected and adjusted and the plant placed in conditional service for not less than twenty-four hours, remaining so until relieved by order of the commission, except when permission to omit this precaution is received from the commission in advance. Conditional service is interpreted to mean that all units and other apparatus involved be connected and operated from the interlocking machine in the tower. However, all trains shall come to a stop at the governing home or dwarf signal regardless of its position and such signal shall not be operated to give a proceed indication until after the train has made the prescribed stop.

Prior to or accompanying a petition for the inspection and approval of a completed interlocking plant there will be required a track plan, a locking sheet and dog chart showing the arrangement of locking in the machine as installed, wiring plans showing in detail all circuits, and a manipulation sheet with or without track diagrams as required by the commission showing in tabulated form the numbers of all levers manipulated for any given route designated on the track plan.

A suitably framed manipulation chart and track diagram shall be properly placed in the interlocking tower. The terminal ends of each track on this chart shall be numbered or lettered to correspond with the above track plans.

The petition for inspection of any interlocking plant, when possible, shall give three days' notice in advance of the time when the plant will be ready for inspection. If the interlocking plant is found to be installed in accordance with the approved plans, a temporary permit will be issued to the railroad company in charge, pending the issuance of formal permits.

Except when approved by the commission, all interlocking signals must be of the semaphore type. Semaphore arms must display indications to the right of the signal post, except where the physical conditions on a road require the display of signal indications to the left.

When required by the commission, all home signals must be equipped with not less than two arms. Unless operated by power all home signals in mechanical plants must be pipe-connected, except when otherwise approved by the commission. When used in connection with automatic train-stopping devices, the home signal may be located immediately opposite the means for controlling the apparatus of the train-stopping device. When used in connection with derails and other units the home signal must be located as far in the rear of such units as is necessary to secure full protection, but in no case shall it be less than 5 ft. in the rear. When home signals are semi-automatic

or form a part of an automatic block signal system, calling-on arms or some other means may be used for advancing trains. All high-speed signals located in automatic block signal territory shall be semi-automatic and form a part of the block signal system.

Dwarf signals, when used, must be located and connected in the same manner as home signals. Advance signals may be used when necessary and must be installed in the same manner as home signals.

On level and ascending grades distant signals shall be located not less than 2500 ft. in advance of their respective home signals. On descending grades the minimum distance of 2500 ft. shall be increased at the rate of 100 ft. for each 0.1 per cent of gradient. All high-speed tracks must be equipped with power-operated distant signals having electric locks or other suitable apparatus to prevent changing of the route until such signals have indicated their normal position.

In placing derails in the tracks of electric roads consideration will be given to speed and character of traffic. Derails must be of an approved pattern, suitable for the purposes intended, and so placed with reference to grades, curvature, bridges and other tracks as to secure a maximum of efficiency and safety. Where physical conditions require their use guard rails shall be placed between the track rails, parallel to and not less than 10 in. distant in the clear therefrom.

Automatic train-stopping devices which are a part of a system of automatic train control approved by the commission may be used in lieu of derails. In such devices the means for automatically applying the train brakes shall be located a sufficient distance in the rear of the fouling point to insure a safe braking distance.

In mechanical plants all facing switches, split-point derails in main tracks and all slip switches and movable point frogs must be locked with facing point locks. All other derails, switches and other units must be locked either with facing point locks or with switch and lock movements. In plants equipped with mechanical signals all derails must be provided with bolt locks, as must also all switches, movable point frogs and other units where conditions require them.

Unless otherwise provided, all derails, switches, movable point frogs and other units shall be equipped with detector bars of approved design not less than 53 ft. in length, and all crossings shall be equipped with detector bars of suitable length except where electric locking is installed and at outlying crossings of simple character where no switching is performed when the plant is equipped with time locks.

Unless equipped with electric locking, time locks must be installed to prevent the changing of high-speed routes until after the home signal has displayed the stop indication for a predetermined time. Electric locking may be provided in place of time locks and crossing bars. When a railway company is equipped with sufficient maintenance forces for properly maintaining electric detector circuits, such circuits may be used in place of mechanical detector bars.

All mechanical interlocking machines shall have the locking so arranged as to be effective before the operating conditions of any circuit directly controlling a unit can be changed. All interlocking machines must, when practicable, be provided with means for locking or sealing the mechanical locking and indication apparatus in such a manner as to prevent access to any except authorized employees.

Signal towers shall be so placed and be of such height and size as best to serve the purpose for which they are intended. The use of interlocking towers for purposes other than interlocking, dispatching and block work is undesirable. If work other than interlocking is carried on in the tower, a suitable partition or railing must be provided to prevent outsiders from having access to interlocking apparatus and interfering with the duties of the operator or towerman.

When an interlocking plant is taken out of service the commission must be notified immediately. Under such circumstances train movements must not be governed by interlocking signals but by the usual precautions prescribed by statute governing train movements over and across railroad grade crossings, junctions and drawbridges.

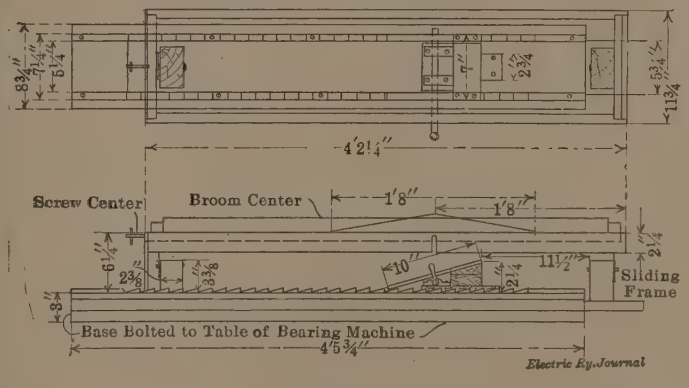
Reports for each interlocking plant shall be filed with the commission by each railroad company concerned, which reports must be filed in manner and form prescribed by the commission.

The rules were formally adopted on Oct. 8, and are to become effective on Dec. 1, 1913, in the State of Wisconsin, the order establishing them being signed by David Harlowe, John H. Roemer and Halford Erickson of the Railroad Commission of Wisconsin.

JIG FOR BORING SWEEPER BROOM CENTERS

A simple jig for use in boring holes in broom centers for rattan broom snow sweepers has been used effectively this season in the Wolf Street shops of the New York State Railways at Syracuse. It is made up with a base fastened on the table of the boring machine and a sliding carriage in which the broom center is clamped. The base consists of a 1-in. board on the sides of which two 1-in. strips 1⅜ in. wide are screwed, leaving a guide-way for the 1-in. carriage base. On top of the side strips and projecting over the carriage base are two saw-tooth racks.

A frame is mounted above the carriage base on heavy wood blocks. Iron plates project downward from the ends of the frame and rock on bolts which extend through the blocks. The frame is shown in plan with the broom center removed in the upper view of the illustration. The lower



Jig for Boring Holes in Center Boards for Rattan Sweeper Brooms

view shows the broom center in position in the frame. The broom center is carried on screw center points which, when set up against the ends of the broom center, clamp it in the frame and the frame in one position at the same time.

On the sliding base is a ratchet block carrying two ratchet springs, one on each side, their ends bearing on the saw-tooth racks. The teeth of these racks are spaced apart a distance equal to that desired between holes in each row in the board. The springs may be raised by means of a cam operated by a rod and handle. One side of the frame is notched out to clear this cam rod.

The operation of the jig consists in clamping the broom center in the frame. The carriage is then pushed to the extreme position at the right and the springs are released. The carriage is then pulled back to the left notch by notch. After a row of holes has been bored the broom center is rotated through an angle corresponding to the desired distance between rows and the operation is repeated. The jig has reduced what was formerly a very tedious operation to a very simple one.

COMMUNICATION

SATISFACTORY EXPERIENCE WITH ELECTRIC OPERATION

Butte, Anaconda & Pacific Railway Company
Anaconda, Mont., Oct. 7, 1913.

To the Editors:

In reply to your inquiry I would say that on Oct. 1, 1913, the Butte, Anaconda & Pacific Railway established regular electric passenger service between Butte and Anaconda. For approximately four months previous to this the freight service between East Anaconda yards and the smelter had been handled electrically. During this period electric locomotives have made approximately 55,000 miles and have delivered to the smelter about 1,500,000 tons of ore. Since starting the electric service there has been no failure of any of the electric apparatus and no delay in any way attributable to electric operation.

The substation at Anaconda has been in continual service twenty-four hours a day with no more than ordinary care and without replacement of any parts. The locomotives have been operated by the steam locomotive enginemen and have been maintained by the regular shop force with the addition of one man experienced in electric operation. They have met every requirement and there has been no failure or replacement of locomotive parts.

The overhead contact system has been highly successful, and there have been no failures and no accidents. The wear of the contact wire is inappreciable. The original pantograph rollers on the locomotives are still in use and show very slight wear notwithstanding the severe conditions imposed by the smoke and soot deposited on the wire from the steam locomotives during the several months of construction. Our experience up to the present time indicates the complete success of our electrification and justifies the existing optimism and enthusiasm for heavy railroad electrification.

H. A. Gallwey,
General Manager.

CHANGES IN BROOKLYN DISCIPLINE CODE

Under date of Oct. 16, 1913, the Brooklyn Rapid Transit System has issued a new edition of its violation code covering the surface lines. The original code was published in full in the Electric Railway Journal for April 13, 1913, as part of an article entitled "The Merit and Demerit System of Discipline in Brooklyn." The changes are few in number and were made partly to embody violations which were not thought of when the first code was prepared and partly to change some ratings. The changes follow:

Violations, under "Duties of Position," 4 (a) "Permitting others to perform one's duty" and (b) "Performing another's duty without authority," have been changed to "L," or "limits," which means a number of demerits recommended by the local assistant superintendent and approved by the superintendent of surface lines; and an addition has been made: (c) "Allowing passengers to pull bell," with one or two demerits for same. Under "Signals," 13 (a) "Failing to flag follower when cars stop on bridges" has been added, with a charge of one to three demerits. Under "Intemperate Habits," violation C-8, covering the use of tobacco on duty, has been changed from a fixed number of demerits to discretion of superintendents. Under "Passenger Protection," violation F-1, "Failing to protect passengers boarding and alighting," has been extended by adding "or while riding on cars." Violation F-2, "Allowing passengers to ride in forbidden places," has been changed from fixed demerits to discretion of superintendents. Violation F-3, relating to "Safety Appliances," has been widened to include (a) "Running boards, side doors, steps and gates not properly secured," with fixed demerits. Under "Accidents," violation G-3 (g) has been changed from "Failing to make prompt call for wrecker (when necessary after accident)" to "Failing to make prompt call for wrecker when necessary." Under "Equipment," violation I-16 (a) has been changed from "Inspection of equipment neglected before leaving depot" to "Failing to trim car properly when laying up same." Under "Rules for Passengers," J-7, "Failing to enforce smoking regulations," has been changed from fixed demerits to discretion of superintendents. Under K-2, "Inattention to Routine," violation, "Windows and door curtains improperly adjusted," has been changed to read: "Windows and curtains improperly adjusted." The penalty for violation K-8 (c), "Failing to lock registers," has been reduced from five to two or three points.

SOUTHERN TRACTION OPENS NEW 120-MILE INTERURBAN LINE

On Sept. 30 the management of the Southern Traction Company, Dallas, Tex., formally opened its new 151-mile interurban line between Dallas and Waco and between Dallas and Corsicana. The opening of this new line was fittingly celebrated by the citizens of Waco, Hillsboro and Waxahachie, the programs beginning upon the arrival of the first train over the line, which in all cases consisted of a number of two-car trains bearing the inspection parties.

In a folder announcing the schedule it is stated that

Part of Eight Two-Car Trains Loaded and Ready to Start from Waxahachie, Tex.

hourly service will be maintained between Waco and Dallas and similar service between Corsicana and Dallas. Two classes of service will be furnished, local and limited, and in the present arrangement of schedules the two classes are alternated. The run between Dallas and Waco, 97 miles, will be made in four hours by limited trains.

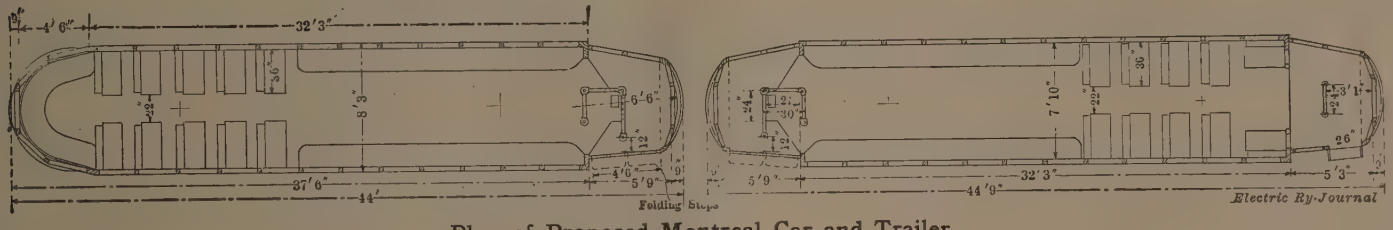
Twenty-two motor cars have been purchased for service on the new line. They are of semi-steel construction with arched roof and have a seating for fifty-six passengers each.

The track is laid with 80-lb. A. S. C. E. rail except through paved streets, where 7-in. high T-rail is employed. Power is supplied from the Texas Power & Light Company's plant at Fort Worth, which supplies six substations. The propulsion current is supplied at 1200 volts d.c., and the rolling stock is designed for both 1200-volt and 600-volt operation.

FORTHCOMING TRAIN OPERATION ON MONTREAL STREET RAILWAY SYSTEM

As noted recently in these columns, the Montreal Street Railway has ordered from The J. G. Brill Company twenty-five motor cars and twenty-five trail cars for train operation on St. Catherine Street, Montreal. The street in question is the trunk line of the Montreal system and is one on which the limit of efficient one-car operation has been reached as the normal headway is one and a half minutes. In one respect the conditions for train operation are unusually favorable because the traffic is heavy enough to permit two-car operation throughout the day. Hence neither the time lost in making up trains nor low trailer mileage enters into account. An important operating feature of the train service will be the arrangement for all loading and most unloading at the center of the train, thereby avoiding the delays which arise when the entrances are a car length or even half a car length apart. This end will be attained by constructing the trailer with entrance and exit at the front end. This plan practically provides an articulated unit with two entrances and two exits at the center of the train and one exit at the front end of the unit.

The framing and other construction materials of the new cars will not differ much from the present standards of the Montreal company, but several changes will be made in the platforms, doors and steps. The new motor car will have longitudinal seats in that half which is nearest the loading platform, but, unlike the present motor car, a



Plan of Proposed Montreal Car and Trailer

vestibule closed with folding doors will make it possible to omit all body doors and end bulkheads. Another innovation will be the use of steps to fold in connection with doors. The seating plan and the door and step arrangement of the trail car are similar to those of the motor car except that the trailer is provided with circular seating at the rear end. The rear platform of the motor car and the front platform of the trailer are practically duplicates in the arrangement of the dividing rail, conductor's stand, aisle widths, etc. These platforms are but 5 ft. 9 in. long instead of the 7-ft. length common on the earlier cars. It will be observed that means for exit and entrance are provided on both loading platforms in addition to the customary sliding door exit on the motorman's platform. An important safety feature will be the wiring of all doors in series so that the motorman will not receive the light signal for starting until every door in the car is closed. The resistance for the door circuit will be carried on the motor car and consequently the safety door signals may be used with or without trailer operation.

Each motor car will be equipped with four 50-hp W-533-T-4 ventilated commutating-pole motors and a K-356 controller. The Consolidated Car Heating Company's three-point connection plug electric couplers will provide quick connection for the heating, lighting and door signal circuits, while a Tomlinson automatic coupler will carry the air line. The principal dimensions, clearances, etc., of these cars are shown on the plans. It may be added, however, that the trucks will be equipped with 30-in. diameter wheels and that the step heights will be as follows: from ground to first tread, 16 in.; from tread to platform, 12 in., and from platform to car floor, 8½ in.

FOREMAN'S POCKET LEVEL

Devised at the request of foremen on the Florida East Coast Railway to enable track leveling to be accomplished without lying on the ground to sight along the rail, a trackman's pocket level has been developed from a cigar box with an inclined piece of looking glass to the form illus-

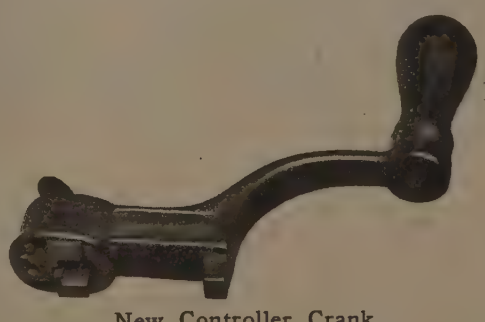
Home-made Pocket Level

trated. It comprises an aluminum box, 6 in. long, 2⅜ in. wide and 2¼ in. high, with a level bubble in the rear end. Inside is a mirror inclined to a 45-deg. angle, while across the front and top are removable pieces of ordinary glass scratched so that when level one may stand erect and direct the line of sight in a horizontal level line by superimposing the image of the scratch on the vertical glass under the line on the horizontal glass.

As the scratch on the vertical glass is 1 in. above the base, two small targets 1 in. high are provided so that a parallel line of sight on railroad grades may be obtained by setting the large white target not more than 300 ft. away and wedging the level until the two scratches and the top of the target coincide. Intermediate points may then be adjustable by sighting on the smaller target. The opening enables a middle-sized man to stand erect and see small targets about 300 ft. away. J. G. Home, Florida East Coast Railway, St. Augustine, Fla., manufactures the level.

NEW CONTROLLER CRANK

A new controller crank, called the "Griptite," and shown in the accompanying illustration, has been assigned for manufacture by the Traction Appliance Company, Inc., Vincennes, Ind., to the Lord Manufacturing Company, Brooklyn, N. Y. This crank clamps the controller post firmly on all four sides, thereby holding the handle thoroughly rigid. The obvious result is that wear on the controller post or on the parts of the crank is eliminated. The clamping is accomplished by a thumb screw or, where specified, with a cap screw.



New Controller Crank

NEAR-SIDE CARS FOR ATLANTIC CITY

The delegates at last week's convention of the American Electric Railway Association had ample opportunity to see in operation the twenty-six near-side cars which were recently completed for the Atlantic City & Shore Railway by The J. G. Brill Company. The near-side car has proved

Interior View Showing Conductor's Stand Inside of Car

a complete success in Atlantic City from the start, this result being aided by the fact that the company had previously been operating with near-side stops. The cars embody the very latest features of near-side design, including the use of fully glazed doors and placing the conductor's station within the body of the car as illustrated.

The design comprises all-steel bottom framing with side sills of 5/16-in. plate with a maximum width of 18 in. These plates are reinforced top and bottom and vertically by light angles. An upper truss rod at the front end of the car prevents deflection of the overhang of the main frame. The cast-steel bolsters have ends which are lipped down under the side sills and are designed to carry 10,500 lb. at each end when supported at the center. The framing between the bolsters includes eight crossings built up of angles with diagonal cross members. The side posts are tenoned into a yellow-pine sill and are bolted to the lower angle of the sill plate and also bolted through the vertical

General View of Near-Side Car for Atlantic City Showing Doors Opened

angles riveted to the sill plates. The wooden side panels are covered with cold-rolled sheet steel, and at the bottom is a 2-in. x 3/16-in. steel molding beveled on the top edge. The plain arch roof is supported by compound carlines with 1½-in. x ⅜-in. steel members at each post and wooden carlines between. The bodies are mounted on 39-E single motor trucks. The door arrangement consists of entrance and exit doors on the front platform which may be operated independently or together by mechanism under the control of the motorman, and an emergency exit at the rear which is operated from the conductor's position.

The car seats fifty-one passengers on fourteen transverse seats, a circular seat at the rear end and longitudinal seats at the front.

A NEW AUTOMATIC COUPLER

A new form of automatic coupler for surface cars has been placed upon the market by George H. Putnam, Boston, Mass. It has been named "Simplex," owing to the fact that it is designed with the idea of effecting the greatest degree of simplicity and using the smallest number of parts. The device consists of a "coupler box," or drawbar, which is set into the drawbar pocket on or below the bumper

New Automatic Coupler—Coupler Boxes Locked Together

New Automatic Coupler—Coupler Box with Long Coupling Bar in Place

beam of the car. Into this pocket is inserted, when two cars are coupled, a round bar with a shoulder at each end, as shown in one of the accompanying illustrations. The coupler box is held in the drawbar pocket or attached to the radius bar by a pivot pin in the same manner as the ordinary flat drawbar.

The action of locking is effected by a block which drops behind the shoulder on the coupling bar when the latter is inserted in the end of the coupler box, the conical end of the bar wedging up the block until it can drop behind the shoulder. The lock is held in place by a flat spring on the outside of the coupler box, and it may be raised, when the cars are to be uncoupled, by means of an arm attached to the ring shown on the side of the box in the illustrations.

A combination coupling bar with one slotted end may be used if it is desired to couple cars to foreign equipment, and an extra long bar may be used if it is desired to separate the coupled cars so that it is not necessary to have the coupler faces extend beyond the edge of the bumper.

The Mexican government has granted a ten-year concession to the Mexico Tramways for operating a freight and express service on all lines of the system in the federal district. The tramway is permitted to carry freight from the smallest package to a carload. There are six classifications, the rates ranging from 3 to 7½ cents (U. S. currency) per kilometer (0.62 mile), per 1000 kilos (2204.6 lb.). Coal will be charged at the rate of 25 cents per ton without regard to distance. The company will store freight in warehouses pending its receipt by the owner, with no charge for the first two days.

News of Electric Railways

The Boston Arbitration Hearings

The recent hearings before the Boston Elevated Railway arbitration board have been occupied mainly with the presentation of testimony in regard to working conditions and wages of employees in shops and carhouses. John Lindall, superintendent of rolling stock and shops; Clark Doty, general foreman of shops, rapid transit lines, and F. W. Garrett, superintendent of the Albany Street shops for surface car repairs, testified that advances in pay must be approved successively by foremen, superintendents, heads of departments and the executive officers of the company.

Mr. Lindall said that the pay of pitmen, of whom there are from 225 to 250 in the road's service, ranges according to length of service from 19.5 cents to 28.5 cents an hour. Night pit foremen receive 30.5 cents an hour. Mr. Lindall said that his recommendation urging the adoption of a nine-hour day in the department of rolling stock and shops had been adopted. The classification of pitmen according to experience was necessary in dealing with the complex equipment of modern cars. Repairs had to be specialized and certain classes of work could not safely be intrusted to men without experience along special lines of inspection and light repairing. A man starting work as a pit apprentice received 19 cents an hour, and if of average intelligence he attained the maximum pay and responsibilities of the work in three to four years.

Mr. Doty explained the organization of the maintenance force on the rapid transit lines. The repair shops were located at Sullivan Square, Guild Street and Eliot Square, Cambridge. The pay of elevated car cleaners was raised in the last five years from 15 cents to 20 cents an hour. The last increase was secured by giving the former pay for one hour's less work a day. He considered this a fair wage in view of the company's practice of advancing men from the grade of car cleaner to pit helpers at the rate of 21.5 cents an hour. So far as possible the repair work on the rapid transit lines was conducted to reduce the amount of Sunday work to the minimum. Of 129 men in this service about thirty-five were required in the carhouses on Sundays, including one or two for emergency work at each machine shop. The men were allowed to rotate on Sunday work. At Sullivan Square, the principal repair shop center of the rapid transit lines, the shop force worked fifty-four hours a week. On Sundays the day's work was eight hours. In connection with surface car cleaning it was brought out that one man devoted his entire time to visiting the various carhouses with a vacuum cleaner. His compensation was $2.07 per day.

Mr. Garrett said that in his opinion multiplied classifications of shopmen should be greatly reduced, to enable employees to attain higher rates of pay more quickly when duly qualified. He contended that any policy of holding men down to low wages when higher wages were warranted was not economy but extravagance. Last summer he had recommended an extensive change in the classification of employees, with some modifications in the way of higher wages. These recommendations were being held in abeyance.

In the testimony of individual employees the following ratings were presented: air-brake inspector, rapid transit lines, covering forty-one cars twice a week, at the rate of thirteen to fourteen per night of five hours, rate, helper classification, 21.5 cents an hour; truck gang, removing wheels and repairing trucks, rates from 21 cents to 28.5 cents an hour; air-compressor stripper, repairer and assembler, $11.40 a week; wheel grinder, Sullivan Square shops, rapid transit lines, 21.5 cents an hour; inspector of drawbars, trucks, draft rigging and hangers, surface lines, handling twenty-six cars a day, 21.5 cents an hour.

Evidence on behalf of the employees of the Boston Elevated Railway was closed on Oct. 17. The board then adjourned until Oct. 29, at which time the company's side of the case will be presented. Several days were occupied prior to the last session by the presentation of testimony emphasizing the increase in union wages in various lines of trade in the past fifteen years at Boston. The piecework system in the company's shops was criticised by representatives of the employees' organization. In answer to criticisms of the classification of employees at the Bartlett Street shops, Harry L. Libby, superintendent, stated that in his opinion six classes of woodworkers and four grades of painters were necessary. The point was brought out that these shops submitted competitive bids to the management of the road for building articulated cars and performed the work at about 8 per cent less cost than was provided in the estimates. The costs as determined contained no superintendence or other overhead charges. Mr. Libby had made no recent recommendations for wage increases.

Proposed Sale of Toronto Utilities to the City

Owing to franchise stipulations which are considered restrictive by the city, the municipal authorities of Toronto, and particularly Mayor H. C. Hocken, are desirous of purchasing the street railways within the city limits. These railways are nearly all the property of the Toronto Railway, although portions of the lines of the Toronto & York Radial Railway and the Toronto Suburban Railway are within the city limits. Sir William MacKenzie is the president of the Toronto Railway, and he and his associates also own or control the Toronto Electric Light Company. The Mayor desired to secure only the street railways originally, but Sir William MacKenzie refused to sell the railway properties without the lighting property, so that the purchase of both is under consideration.

Mayor Hocken retained consulting engineers to report on the value of the properties. The report on street railways was made by Bion J. Arnold, Chicago, and John W. Moyes, Toronto, and was made public on Oct. 13. The report on the electric light property was made by R. A. Ross, Montreal. It fixed the total value of the property of the Toronto Electric Light Company at $6,132,754. The price asked is $8,000,000, which leaves $1,867,246 as the amount to be paid for the franchise and the business. The total amount asked for the street railways within the limits of Toronto is $22,242,405. The report of Messrs. Arnold and Moyes fixes the total value of the railways at $20,944,478. The difference in the case of the railways is caused by adding other items, such as estimated increment in the value of real estate during the eight years that the franchises have still to run.

The report of Messrs. Arnold and Moyes includes an investigation of the cost new and the present value of the railway properties, as of July 1, 1913, together with a study of the operation of the properties. The investigation was made to determine the value of the properties, including rights under franchises expiring in general on Sept. 1, 1921, in order to determine a fair price in case the city decides to purchase. The valuation includes both physical values and intangible values, the latter being the estimated present monetary value of the net profits, after all deductions for operation, taxes and interest. It has been assumed in the Arnold-Moyes report that such rights as the suburban railways now have to distribute electrical energy for light, heat and power in a limited area in Toronto shall be delivered to the city if the properties are purchased.

In a letter to Mayor Hocken supplementing the report, Bion J. Arnold says that if suggested conditions are complied with he believes that it will be well for the city of Toronto to enter into the proposed arrangement for purchasing the railways. This conclusion applies, however, to the local conditions only. Mr. Arnold says:

"In thus advising I do not wish to be understood as taking any position whatever upon the broad question of municipal ownership and operation versus private ownership and operation, but am simply advising what I believe would be best for the city of Toronto, as a city, to do under the conditions that surround it at present."

In the Arnold-Moyes report the total value of the Toronto Railway is fixed at $20,608,036, of which $9,894,483 is the present value of the physical property as of July 1,

1913, and $10,713,553 is the intangible value of the property as of the same date. The total value of the portions of the property of the Toronto & York Radial Railway within the city is placed at $285,298, of which $91,604 is for physical property and $193,644 is for intangible value. The total value of that portion of the property of the Toronto Suburban Railway within the city is placed at $51,154. Thus the grand total value of all the railway properties, as fixed by the Arnold-Moyes report, is $20,944,478.

In arriving at the cost to reproduce the railways new, Messrs. Arnold and Moyes applied unit prices to inventory and added certain percentages. These percentages, varying from 5 to 15 per cent, were for "organization," "engineering," and "incidentals." The average percentage was 6.4 per cent. There were also added 5 per cent for the cost of securing money and 5 per cent for carrying charges during construction work and general legal expense.

Depreciation percentages taken in the Arnold-Moyes report may be of interest. Some of them are as follows: coal-handling apparatus, 6 per cent; grates and stokers, 50 per cent (that is, 10 per cent a year for five years, no further depreciation being figured after that if the apparatus is still in use); horizontal tubular boilers, 8 per cent; water-tube boilers, 3.5 per cent; steel smoke breeching, 10 per cent; brick and concrete stacks, 3 per cent; heaters, 3 per cent to 6 per cent; pumps, 5 per cent; air compressors, 5 per cent; Corliss slow-speed engines, 3 per cent; automatic high-speed engines, 5 per cent to 8 per cent; piping, 3.5 per cent; generators, 4 and 5 per cent; transformers, 5 per cent; rotary converters, 5 per cent; switchboards and interior wiring, 3 per cent; iron poles, 2.5 per cent to 3 per cent; cedar poles, 5 per cent; pole brackets, 4 per cent; wooden cross-arms, 5 per cent; iron cross-arms, 3.33 per cent; weatherproof cables, 3.33 per cent; lead cables, 3 per cent; transmission-line material, 5 per cent.

The Detroit Wage Arbitration

F. W. Brooks, general manager of the Detroit (Mich.) United Railway, presented his argument on the questions of increased wages and a readjustment of schedules and hours to the board of arbitration on Oct. 16. He said that it would be impossible to carry out the demands of the union leaders and satisfy the men. If the schedules for runs were arranged as suggested by the union 791 crews would have to be added to the present force, and of this number 748 crews would work nine hours a day and 1203 crews would work from one to eight hours. Under the proposed schedule 2406 members of the union would work from one to seven hours, or an average of a little less than three hours and forty-five minutes a day, and receive eight hours' pay a day, while the minority, or 1596 men, would work nine hours and receive nine hours' pay.

Mr. Brooks said that the question for the arbitration board to decide was whether the new men should for a short period of time work a longer day than men who have been in the service for eighteen months, in order to earn a fair day's wages, or whether the company should be obliged to add more than 1500 men to its payroll and pay them for an average day's work, when in reality they work not much more than three hours a day. In this connection Mr. Brooks said in part:

"Those having charge of the case for the labor union knew at the beginning that the demands of the public require a heavier service for a couple of hours in the morning and a like period in the afternoon than is required at other hours of the day, and that as a consequence the crews operating cars in the morning for a couple of hours which are not required again until the afternoon could not receive a full day's pay unless their work in the morning was pieced out by the assignment of additional working hours at a later period of the day. They knew that this fluctuation in the demands of the public was the sole cause of the condition of which they complained. They knew that the alternative was to require the company, on a decreased income due to lower rate of fare, to increase its payroll more than 50 per cent a year, or approximately $1,400,000, without getting a single hour's additional service from its conductors and motormen.

"Those having charge of the union case sought to establish the impression that the hours of labor might be more equitably distributed but that the company had declined to do so. They sought to give the impression that, while many of the men performed a day's work over unnecessarily long hours, there were also a great number of the men who worked only one to two hours a day. Emphasis was laid on the unwarranted claim that 112 men on the schedules submitted received only one hour's pay a day, a claim shown to be baseless. Equally baseless is the assertion that 2500 men must work under conditions requiring an elapsed time of eighteen and nineteen hours in which to perform a day's work.

"Much stress is laid upon the clause in the Detroit United Railway ordinance which says that the work-day shall be ten hours, to be performed in twelve. This provision has been disregarded by both men and the company in their written agreements in the past. The present proposal of the union disregards it. The union here demands a nine-hour day, to be performed within eleven hours. The claim then is that it binds the company but does not bind the men. The members thus unconsciously and unintentionally disprove its validity."

Mr. Brooks objected to the demand of the union for unlimited transportation for employees. He said that this would result in the distribution of thousands of tickets among the men. Because of the obligation of the company to furnish its service to the public at greatly reduced rates, he said that strict economy must be practised. He asked that the agreement be changed to provide for a limited concession to the men in this connection. The question of hours of labor had been held over the company as a club to force other concessions.

In discussing the question of wage increases Mr. Brooks said in part:

"The company has many thousand employees. In the conduct of its business throughout the years of its existence from 1901 it has from time to time increased the rates of pay to them all as it was able to do so, and at the same time has assumed the burden of increased cost of doing business, an increase in greater proportion than its increase in income. As is known, it has recently agreed to an arrangement with the public under which its income has been enormously decreased, and it is now contending with the serious problem of bare existence. It desires in good faith to continue under this arrangement until the actual results demonstrate whether it will be possible to exist under such terms. I am mindful that in this connection the exigencies of politics and the interests of self-seeking individuals have prompted newspapers and irresponsible persons to attack the company and its management viciously and maliciously and to give utterance to unfounded, unwarranted and scandalous statements, doubtless intended to intimidate those upon whom the responsibility for the conduct of the business rests, and to coerce them into submission to demands that are shamefully unfair and unwarranted by any condition that would be tolerated by honorable men."

W. D. Mahon will have until Oct. 20 to prepare argument in rebuttal.

The Menace of the Automobile in Cleveland

John J. Stanley, president of the Cleveland Railway, and Peter Witt, street railway commissioner, met on Oct. 13 to discuss the increasing number of claims for damages filed as the result of collisions between cars and automobiles. The law in Ohio throws the burden of proof on the company. Mr. Stanley stated that two-thirds of the accident claims which are settled by the company are for injuries in connection with collisions between cars and automobiles. He said that drivers of automobiles were very careless and took all kinds of chances in passing in front of moving cars.

Mr. Stanley said further that congestion in the downtown streets is becoming very serious and that eventually certain streets would have to be designated for automobile traffic. Mr. Witt said there were 15,000 automobiles in Cleveland and estimated that within two years the number of machines would increase to 30,000. He said there should be an ordinance requiring pedestrians to halt at the curb and see if the streets are clear and that they should be required to cross the street only at regular street intersections. He also suggested that automobiles should be required to stop before crossing car tracks.

The company has posted notices in all the carhouses asking the men not to talk politics. This was done on the assumption that the street railway question has been taken out of politics and that the rate of fare will be settled on an economic basis. It is said that the men are working against the re-election of Mayor Baker, because of his attitude in connection with the readjustment of schedules and working hours. Many of the men are said to consider that they were snubbed by the City Council when they asked for a hearing of their grievances before that body.

An agreement has been reached between the city and county authorities for changes in the plan of the new Superior Avenue bridge over the Cuyahoga River so as to allow the construction of a subway to be used in connection with the routing of the surface cars. Arrangements have been made to give the railway the exclusive use of a lower deck of the bridge.

At a recent conference between Mr. Stanley and Mr. Witt it was decided to instruct Terrance Scullin, master mechanic of the Cleveland Railway, to prepare plans for fifty new motor cars.

Bids Called for Construction of Two More Sections of New York Transit Lines

The Public Service Commission for the First District of New York will receive bids on Nov. 12 for the construction of Section No. 5 of the Seventh Avenue subway in Manhattan, and on Nov. 18 for the construction of the extension of the Steinway tunnel in Queens, from the present terminus of the tunnel in Long Island City to the Queensboro Bridge. Section No. 5 of the Seventh Avenue line covers that portion of the proposed subway lying in Seventh Avenue between Sixteenth and Thirtieth Streets. The letting of the contract for the extension of the Steinway tunnel will be the last construction contract to be made under the dual system for the borough of Queens, as all other parts of the new rapid transit system in that borough are now under contract. It will not be long, however, until steps for the construction of the extension of the Corona line from Sycamore Avenue, Corona, to Main Street, Flushing, will be taken. The commission has authorized the immediate construction of this extension, and has sent a letter to the Board of Estimate and Apportionment asking that board whether it can find the money to pay for it as the first extension of the dual system.

The commission held public hearings recently on the forms of contract for the construction of the proposed tunnels under the East River to Brooklyn for operation by the Interborough Rapid Transit Company and the New York Municipal Railway Corporation under the dual system contracts. The consent of the United States government to the construction of these two tunnels has been obtained, and the engineers of the commission will have the working plans completed by the end of the year, so that construction should be undertaken early in the new year. The tunnel for operation by the Interborough company will run from Old Slip, Manhattan, to Clark Street, Brooklyn, and that for the New York Municipal Railway Corporation will run from Whitehall Street, Manhattan, to Montague Street, Brooklyn.

New York Traction Suits Appealed

A brief on behalf of the government has been filed with the United States Supreme Court in the suits against Frederick W. Whitridge, as receiver of the Third Avenue Railroad, and Adrian H. Joline and Douglas Robinson, as receivers of the Metropolitan Street Railway. The questions which the Supreme Court is asked to pass upon in these cases are:

When a corporation is brought into a court of equity at the suit of a creditor or mortgagee, and that court appoints a receiver of all its assets including its franchise and authorizes the receiver to carry on all its business, is the corporation thus situated doing business with the advantages which inhere in the peculiarities of corporate or joint stock organizations, and is the receiver obliged to make certain fiscal returns?

Lower courts held that the Third Avenue Railroad and the Metropolitan Street Railway were not engaged in or doing business, and that the receivers did not have to make any returns under the corporation tax law. But the government takes the opposite viewpoint, that the companies still retained legal title to their properties and the court merely assumed supervision of their business for the benefit of their creditors, and ultimately of themselves and their stockholders, by putting a receiver in charge.

Terms of Tentative Des Moines Franchise Considered Onerous

Emil G. Schmidt, president of the Des Moines (Ia.) City Railway, in a recent letter to the City Council said that the company could not meet the terms of the ordinance which has been proposed by the city for extending the franchise of the company. This ordinance provided among other things that the city should have the right to order new cars, improved service and all equipment for safety and convenience of passengers; designate where street cars shall stop; order extensions when conditions are found to warrant them; fix schedules and routes of street cars; name the kind of street cars to be placed in service; increase or diminish service; require the company to pave, repave or improve any pavement between tracks and for 1 ft. on either side of said tracks; deal with motive power and use of poles for trolley wires; superintend all rehabilitation, and order any tracks removed.

Mr. Schmidt said the company cannot accept the franchise, as it would be impossible to operate under its terms without raising the fare above 5 cents. He declared that the $5,300,000 should be considered as the valuation of the system.

Following the meeting of the Council at which his letter was read, Mr. Schmidt is reported to have said:

"You can assure the people that we are not going to sit down and say 'we won't play any more' because the Council has drawn a franchise that we cannot accept. We are going ahead with our improvements regardless of the attitude of the Council. As I understand it, good service is the thing of first concern with the people of Des Moines, and that is what we want to give. We are not demanding anything unreasonable in the way of a franchise, but would be willing to operate under conditions obtained in other cities of the class of Des Moines in the Middle West."

Pittsburgh Subway Matters

The Council of Pittsburgh discussed the subway problem recently in connection with a revised ordinance from the law department. It is said that the bill does not meet the views of all the councilmen and that final action will not be taken upon it until reports have been received from the rapid transit committee of the Chamber of Commerce and the engineers' society. Attorney A. E. Anderson, of the Pittsburgh District Railroad, said in a recent communication to Council:

"In relation to the action of the committee on public service and surveys at its meeting of Oct. 1, 1913, providing for a public hearing upon the construction and maintenance of a subway in the city of Pittsburgh, we will be prepared to present, if desired, preliminary plans supplementing our ordinance now pending, and to meet all comers upon the legal, engineering, financial and operating phases of the terminal subway problem as proposed by this company, to the end that the members of the committee and the public generally may become fully advised as to the scope of our intentions and purposes, benefits and possibilities of success and all data and information which can at present be safely made public."

Mayor Magee of Pittsburgh has expressed himself as follows in regard to the subway ordinance which is now before the committee on public service and surveys of the City Council:

"The passage of a subways ordinance is not especially my concern. I was asked to prepare an ordinance which would meet my views and I have done so. I do not know where the impression came from that I had reached an agreement with Council. The ordinance, as it stands, is that which I would sign if it were passed, but I am not urging its passage. That is the concern of Council. I have

made it plain, repeatedly, that I favor a municipally owned subway. Unfortunately, the Legislature adjourned without making provision for a constitutional convention. This leaves things in such shape that the city cannot hope for a subway unless it is built by private capital. Under these conditions I am willing to sign an ordinance granting a franchise to a private company upon proper terms. If the delay continues until there is a campaign for members of the Legislature, so that the amendment of the constitution may again become an issue, I shall probably then oppose the passage of any franchise ordinance."

Detroit's New Charter Adopted by Commission

By a vote of eleven to five the charter commission of the city of Detroit on Oct. 17 adopted the charter as it is to be presented to the people for approval. Three members were absent and one left before the ballot was cast. The provisions relating to the municipal ownership of public utilities have been collected into a chapter. Only two important changes were made in them by the four attorneys to whom they were submitted. The authority of the street railway commission to employ attorneys was taken away and that work will be done by the corporation counsel. The commission must pay for any extra expense incurred by the city. The commission was made subject to the civil service and minimum wage provisions of the charter.

The question of the constitutionality of the Verdier home rule act was argued before the Supreme Court at Lansing on Oct. 17. This is the case of George H. Barbour, Fred T. Moran and Charles A. Ducharme against City Clerk Richard Lindsey and the election commissioners of Detroit to prevent them from submitting to the people a proposed bond issue to provide funds for municipal railway purposes. The case was tried originally in the Wayne Circuit Court and was appealed to the Supreme Court.

Politics and Transit in New York

Reference has been made previously in the Electric Railway Journal to the claims made by the candidates for Mayor of Greater New York in regard to their activities in connection with the dual rapid transit system contracts. Edward E. McCall, chairman of the Public Service Commission of the First District, who is the Democratic nominee, spoke with particular reference to rapid transit matters before the New York University Forum on Oct. 12. Among other things he said:

"Among the opponents of the dual subway system was the gentleman who is my opponent in this election. He waged a stubborn and relentless warfare against the adoption of the contracts and in favor of municipal construction and operation. The vital issue to the people of this city was that they called for a single 5-cent fare and made possible one continuous ride of 34 miles for a nickel. Mr. Mitchel objected to the interposition of private capital in the construction and operation. The question as presented was academic because the contracts called for $375,000,000 capital and the city was practically bankrupt."

On the other hand, Mr. Mitchel, the fusion candidate, accuses Mr. McCall of favoring the Interborough Rapid Transit Company, particularly with reference to the contract involving the Steinway tunnel to Long Island City.

Frederick W. Whitridge, president of the Third Avenue Railway, in a long communication to the editor of the New York *Times*, which appeared as a paid advertisement, declared himself for Mr. McCall, of whom he said:

"Now, Tammany has this year, speaking in the name of the democratic party, nominated for Mayor Judge McCall. I know that gentleman to be an honest man, of some executive experience and capacity, and a person of resolution and common sense, and notwithstanding the character of much of the support behind him, I intend to vote for him, and urge my friends to do likewise, because I believe, first, that he is a man better fitted to be Mayor than Mr. Mitchel, and, second, because the manner of opposing Tammany which has come to prevail does not seem to me to be worth while, as it never can be wholly effective, and I think it should be smashed for good."

Of Mr. Mitchel Mr. Whitridge said in part:

"Mr. Mitchel, I understand, is an amiable, forceful, earnest and, considering his thirty-three years, rather an accomplished young demagogue. At all events, he is an avowed advocate of municipal ownership of all public utilities. There are honorable men who hold the same view. Some of them even swallow the whole Bellamy program, but my mind does not enable me to comprehend how a man can suppose that what succeeds in this line at Birmingham and Glasgow, and many German cities, can or must necessarily succeed in New York. To advocate that doctrine it seems to me is impossible without shutting one's eyes to plain facts, and the injunction of St. Matthew and St. Paul to the effect that he who calleth his brother a fool is in danger of hell fire alone restrains me from endeavoring accurately to characterize them."

As an aftermath to this communication the story was printed in the newspapers that McCall buttons had been distributed among the employees of the Third Avenue Railway. Mr. Whitridge promptly repudiated this in a communication to the employees as follows, sending a copy of his letter to the editor of the *Times:*

"The *Times* of this morning publishes a silly story which seeks to convey the impression that I or some officers of this corporation are seeking to influence your vote in the coming election. I think every one of you knows that any such story is untrue. This corporation has no politics and no religion, though it differs from a newspaper corporation in that it does have morals. So far as I am concerned I have never distributed McCall buttons nor authorized it, nor do I believe it has been done by any officers of this company. I am too old to undertake to impose my personal opinions upon anybody, though I confess I have once or twice, out of sheer kindness of heart, tried to influence an editor in the hope of lessening or diverting the apparent peril to which he was exposing his own soul."

Brakeshoe Hearing in New York

On Oct. 22 a hearing was held before Commissioner Eustis of the Public Service Commission for the First District of New York in regard to the use of special brakeshoes on street railway cars for the mitigation of noise.

C. L. Wilder, electrical engineer for the commission, testified that an investigation had been begun in 1909 as to the cause of "squealing" on the Metropolitan Street Railway and other city lines. It was thought at first that this noise was due to friction between the brakeshoe and the wheel, resulting in vibrations being set up in the wheel. Further investigation showed, however, according to Mr. Wilder, that the "squealing" was caused by friction between the wheel flange and the rail when the brakes were set, the wheel running free and seeking the path of least resistance in the gage line when the brakes were not set. It was further evident that steel wheels gave the greatest amount of noise, for these vibrated more rapidly and gave forth a sound of higher pitch and greater volume.

As a means of reducing this noise, Mr. Wilder testified that a certain brakeshoe manufactured by the American Brake Shoe & Foundry Company has been used experimentally on the Madison Avenue line of the Metropolitan Street Railway and upon the Montague Street line of the Brooklyn Rapid Transit Company, but that no extensive demand has yet led to a large manufacture. The shoe has holes cut in its flange, filled with an asphalt or graphite composition, the object being to get a lubricant on the flange of the wheel but not to lessen the coefficient of friction between the shoe and the wheel. In this connection Mr. Wilder mentioned a lead compound referred to in a report of the committee on equipment of the American Electric Railway Association in 1912. In Mr. Wilder's opinion this sort of brakeshoe would cost originally about 20 per cent more than the shoes now used and they might be more expensive in maintenance charges.

Attorneys for the Brooklyn Rapid Transit Company, the Long Island Railroad and the New York Railways, who were present at the hearing, stated that as yet these lubricating brakeshoes have not been developed sufficiently to warrant an order compelling a wholesale adoption. The hearing was postponed until Nov. 5, at which time the street railway companies are expected to lay bare any plans they may have made for the reduction or elimination of "squealing."

First Electric Train Over the Butte, Anaconda & Pacific Railway.—A train of five cars drawn by an electric locomotive was operated over the Butte, Anaconda & Pacific Railway recently, marking the opening of the line between Butte and Anaconda for electric passenger service.

Co-operative Stores Being Considered in San Francisco.—Jesse W. Lilienthal, president of the United Railroads, San Francisco, Cal., has announced that plans are being considered for establishing co-operative stores in the interest of the employees of the company.

Track Laying Completed on Municipal Line in Seattle.—Track laying has been completed on the municipal electric railway which extends from Third Avenue and Pine Street, Seattle, Wash., to Ballard, and it is expected that the new line will be placed in operation before Jan. 1, 1914.

Strike on Ohio Roads.—A strike of motormen and conductors on the lines of the Cincinnati, Milford & Loveland Traction Company, Milford, Ohio, tied up operations for a day or two recently. The men claimed that members of the union had been discharged without cause.

New York Immune from Income Tax on Rapid Transit Lines.—Corporation Counsel Watson of the city of New York has announced that the city, under the provisions of the income tax section of the new tariff bill, will be immune from the payment of any tax on the income which it will derive from its investments in rapid transit construction.

Long Island Railroad Submits New Signal Plan.—C. L. Addison, assistant to the president of the Long Island Railroad, appeared before the Public Service Commission of the First District of New York on Oct. 22 in connection with the investigation of the collision on the electrified Whitestone branch on Sept. 22. He submitted a plan for the operation of the road in the future, and the commission adjourned in order to have the details worked out.

Expenditures for Track Repairs in Toronto.—A by-law is to be prepared by the City Treasurer of Toronto, Ont., to provide for the issuance of debentures covering expenditures on repairs to track allowances during 1910, 1911 and 1912. The amount of such expenditures follows: 1910, $235,942; 1911, $201,359; 1912, $422,963; total, $860,265. The debentures will mature with the expiration of the Toronto Railway's franchise in 1921. They will bear interest at the rate of 4½ per cent.

Nominees for New York Railroad Club.—The regular nominating committee of the New York Railroad Club has announced the following official nominees for officers of the club: George W. Wildin, for president; C. W. Huntington, for first vice-president; Burton P. Flory, for second vice-president; Frederick C. Syze, for third vice-president; R. M. Dixon, for treasurer; Miles Bronson, for executive member for three years; Charles Shults, for member of the finance committee for three years.

Boiler Explosion on Staten Island.—A boiler explosion on Oct. 21 wrecked the plant of the Richmond Light & Railroad Company at Livingston, Staten Island, N. Y., killed six men, stopped trolley cars and extinguished the electric lights on the island. The supplementary power plant of the company at Grasmere was insufficient to restore normal conditions and it was decided to install a cable across the Kill von Kull to bring power from the plants of the Public Service Corporation of New Jersey and another cable across to Brooklyn to bring current from the plants of the Brooklyn Edison Company.

Ceremonies Mark Passing of Cable in Kansas City.—Fitting ceremony marked the passing of the last cable line of the Metropolitan Street Railway, Kansas City, on Oct. 13. At 1.21 a. m. the cable was stopped. A party of veterans was formed to make the last ride from Twelfth and Washington Streets to the top of the hill in the western section of Kansas City. The cable car was loaded with pioneers. Charles Fairchild, aged seventy, said to be the first gripman in Kansas City, made the trip. George L. Starkey, vice-president of the Eagles, secured the last transfer issued on the cable line and will retain it as a souvenir. As the car made its last trip across the railroad yards, engine whistles tooted salutes and the crowd cheered and waved red fire.

Inquiry Into Standards.—William C. Redfield, Secretary of the United States Department of Commerce, has announced that the department will inquire into the standards of public service corporations. The inquiry will be made by the Bureau of Standards and it will be conducted in a spirit of entire friendliness and with the object in view of aiding both the corporations themselves and the public utilities commissions of the states and cities. Congress is to be asked to appropriate $100,000 to begin the work. Mr. Redfield is quoted as follows: "This fund will be used to enable the Bureau of Standards to carry on such investigations as would fix standards of service for public utility companies that would assist the public service commissioners of the states and cities and other authorities to regulate and control these utilities."

Order in Regard to Joint Use of Tracks in Milwaukee.—The Railroad Commission of Wisconsin has decided that it is necessary for The Milwaukee Electric Railway & Light Company to run cars down Wells Street not only during the rush hours but during all hours of the day to relieve conditions on Grand Avenue. Officers of the Chicago & Milwaukee Electric Railroad and the Milwaukee Northern Railway contended that there was no necessity for laying tracks on Wells Street, hence no necessity for determining reciprocal rights in tracks already in the street. In its order the commission directs The Milwaukee Electric Railway & Light Company to pay the owners of the tracks in the street one-twelfth the cost of maintenance and operation of the tracks, together with 8 per cent interest on the total sum invested in the tracks.

Richmond Society of Engineers Organized.—The Richmond Society of Engineers has been organized at Richmond, Va., to afford opportunities for engineers in that city to meet one another, discuss topics of general interest and maintain an engineering library. The present membership list is composed entirely of active members, but provision is made for three other grades—honorary members, associates and juniors. The membership, as it now stands, numbers about fifty-three. The officers chosen to serve until the next annual meeting are as follows: President, Arthur Scrivenor; vice-president, James Bolton; treasurer, P. Parsons Pilcher; secretary, Edwin Wortham. These, with the following members, compose the council, by which the business of the society will be handled: Joseph E. LePrade, Allen J. Saville, John B. Price and Herman C. Schmidt. Meetings to discuss subjects of interest to the members will be held once a month.

Adam Beck on the London & Port Stanley Railway Electrification.—Adam Beck, chairman of the Hydroelectric Power Commission of Ontario, addressed a meeting of the ratepapers of London, Ont., on Oct. 11, on the question of the electrification of the London & Port Stanley Railway. Subsequently he issued a statement that on Oct. 11 a number of English capitalists had waited upon him, together with several Stratford and Brantford men, in regard to a new radial line which it is proposed to run from Brantford to Stratford, London and St. Thomas, and which would then seek to use the new radial line from St. Thomas to Windsor. Mr. Beck assured the deputation that the proposition would be considered by the Hydroelectric Commission. The English syndicate would also want running rights over the London & Port Stanley Railway to enter London and to reach St. Thomas, and this, Mr. Beck thought, could be arranged with the city of London when the road is electrified.

Days of Horse Car Recalled in Kansas City.—The old days of horse and mule-drawn cars are recalled by a column which is being run in one of the Kansas City daily newspapers in which the news of forty years ago is reproduced as it appeared in 1873. A couple of the items which appeared recently as excerpts from the old paper are as follows: "Deservedly popular is the Kansas City & Westport Horse Railroad, because it is one of the best conducted. In a ride from the square to Westport and back yesterday less than two minutes' delay was occasioned, although there are no less than five switches and one change of cars each way. The track is smooth and it is a real pleasure to ride over the road." "Naughty boys persist in placing stones upon the street car track just to hear the women squeal and the drivers swear when the car runs off the track." The note indicates a remarkable change of sentiment in forty years on the part of the paper. The second item is of interest for various reasons, providing a marked contrast between the operating methods of 1873 and 1913.

New Line Opened in Shanghai, China.—Amos P. Wilder, United States Consul-General at Shanghai, China, reports the opening on Aug. 16, 1913, of a 2½-mile electric tramway, the first in any Chinese city as contrasted with foreign settlements. The enterprise is essentially a native one. No foreigner has been allowed to subscribe to the capital, about $130,000, and the installation was carried out entirely by Chinese contractors. The management and working staff are all Chinese. The new line runs along the Chinese Bund from the Marche de l'Est to the Shanghai terminus of the Hangchow Railway. A half mile will be added on completion of an extension to the Arsenal Road. The line is double-track between the Marche de l'Est and Tungkadoo and single-track from Tungkadoo to the railway station. Six cars are now in operation, and twelve cars, with six trailers, are in course of completion. The cars carry eight first-class and sixteen second-class passengers. Power is taken from the Shanghai Inland Electric Works, which formerly supplied the city's light and power. E. Kocher, who made the survey for the new line, is working on the plans for a tramway to be constructed on the boulevard which is to encircle the native city, on the ground formerly occupied by the ancient city wall.

Charles A. Prouty to Direct Railway Valuation.—Charles A. Prouty is expected to retire in the near future as a member of the Interstate Commerce Commission, to become director of the physical valuation of railways. Commissioner Prouty has been a member of the commission since December, 1896, when he was appointed by President Cleveland, and has served continuously since that time, being successively reappointed at the expiration of each term. His present term would expire in 1915. Commissioner Prouty's retirement will make two vacancies on the commission for President Wilson to fill this year. The term of Commissioner Judson C. Clements of Georgia will expire in December. The Interstate Commerce Commission has announced the following division of the country into five districts, each district embracing approximately 50,000 sq. miles of railroad, for the purpose of physical valuation, with headquarters at the city designated: Eastern—Washington, D. C.; Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Vermont, Virginia and West Virginia. Southern—Chattanooga, Tenn.; Alabama, Florida, Georgia, Indiana, Kentucky, Mississippi, Ohio, Panama, Porto Rico, South Carolina and Tennessee. Central—Chicago; Arkansas, Illinois, Iowa, Louisiana, Michigan, Minnesota and Wisconsin. Western—Kansas City; Colorado, Indian Territory, Kansas, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota and Texas. Pacific—San Francisco; Alaska, Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

PROGRAM OF ASSOCIATION MEETING

National Association of Railway Commissioners

The twenty-fifth annual convention of the National Association of Railway Commissioners will convene in the hearing room of the Interstate Commerce Commission, Washington, at 11 a. m. on Oct. 28. The call for the meeting, issued by William H. Connolly, the secretary, says that there are many matters of great public interest which may with propriety and great benefit be brought to the attention of and be considered by the convention. O. P. Gothlin, of Ohio, president of the association, has invited members to present topics in which they are interested for discussion and has also arranged to have certain authorities address the convention on special subjects affecting the regulation of public utilities. Among the reports to be presented by committees are those from the following: amendment of act to regulate commerce, delays attendant upon enforcing orders of railway commissioners, grade crossings and trespassing on railroads, legislation, powers, duties and work of railway commissioners, railroad taxes and plans for ascertaining fair valuation of railroad property, rates and rate-making, railway capitalization, railway service and railway accommodation, safety appliances, statistics and accounts, shippers' claims, statistics and accounts of electric railways, and rails and equipment.

Financial and Corporate

Stock and Money Markets

Oct. 22, 1913.

Many stocks traded in on the New York Stock Exchange ended the day with small gains over their previous closing prices. The list as a whole, however, was heavy and the volume of sales was very small. About noon the market showed signs of decided strength, but in the afternoon dealings declined and quotations sagged off. The sales for the day totaled 278,263 shares. Rates in the money market to-day were: Call, 3@3¼ per cent; sixty days, 4½ @4¾ per cent; ninety days, 4¾@5¼ per cent; four, five and six months, 4¾@5 per cent.

Trading on the Philadelphia exchange was weak to-day and transactions were small in number.

The Chicago market was broad to-day, but the volume of transactions was small. Declines were more numerous than advances. Bonds were dull but steady.

Changes in the tone of the Boston market were frequent to-day, but strength was displayed toward the close of the trading.

The Baltimore market was firm to-day, but trading continued dull.

Quotations of traction and manufacturing securities as compared with last week follow:

	Oct. 15	Oct. 22
American Brake Shoe & Foundry (common)	88½	88½
American Brake Shoe & Foundry (preferred)	130⅞	128
American Cities Company (common)	36	36
American Cities Company (preferred)	64	63
American Light & Traction Company (common)	337	336
American Light & Traction Company (preferred)	103½	103½
American Railways Company	39	38¾
Aurora, Elgin & Chicago Railroad (common)	41½	40
Aurora, Elgin & Chicago Railroad (preferred)	83	82
Boston Elevated Railway	83¾	85
Boston Suburban Electric Companies (common)	7	7
Boston Suburban Electric Companies (preferred)	59	59
Boston & Worcester Electric Companies (common)	a10	a10
Boston & Worcester Electric Companies (preferred)	42½	42½
Brooklyn Rapid Transit Company	86⅛	87
Capital Traction Company, Washington	115	115
Chicago City Railway	160	160
Chicago Elevated Railways (common)	25	25
Chicago Elevated Railways (preferred)	75	75
Chicago Railways, ptcptg., ctf. 1	93	93
Chicago Railways, ptcptg., ctf. 2	28¼	29
Chicago Railways, ptcptg., ctf. 3	a7¾	7½
Chicago Railways, ptcptg., ctf. 4	2¼	2½
Cincinnati Street Railway	112	107½
Cleveland Railway	103⅝	103½
Cleveland, Southwestern & Columbus Ry. (common)	5½	5½
Cleveland, Southwestern & Columbus Ry. (preferred)	30	30
Columbus Railway & Light Company	18	18
Columbus Railway (common)	69½	69½
Columbus Railway (preferred)	88	88
Denver & Northwestern Railway	111	*111
Detroit United Railway	69	69
General Electric Company	139½	141½
Georgia Railway & Electric Company (common)	120	119½
Georgia Railway & Electric Company (preferred)	86	85¾
Interborough Metropolitan Company (common)	13½	14
Interborough Metropolitan Company (preferred)	57¼	57⅞
International Traction Company (common)	40	*40
International Traction Company (preferred)	95	95
Kansas City Railway & Light Company (common)	*22	*22
Kansas City Railway & Light Company (preferred)	30	*30
Lake Shore Electric Railway (common)	7	7
Lake Shore Electric Railway (1st preferred)	92	92
Lake Shore Electric Railway (2d preferred)	25	25
Manhattan Railway	130	128
Massachusetts Electric Companies (common)	13	11½
Massachusetts Electric Companies (preferred)	67	67
Milwaukee Electric Railway & Light Co. (preferred)	100	*100
Nofolk Railway & Light Company	25¼	25¼
North American Company	71⅞	72½
Northern Ohio Light & Traction Company (common)	63	63½
Northern Ohio Light & Traction Company (preferred)	97	97
Philadelphia Company, Pittsburgh (common)	39	40
Philadelphia Company, Pittsburgh (preferred)	40	40
Philadelphia Rapid Transit Company	19⅞	20
Portland Railway, Light & Power Company	56	56
Public Service Corporation	110	111
Third Avenue Railway, New York	38	37½
Toledo Traction, Light & Power Company (common)	30	30
Toledo Traction, Light & Power Company (preferred)	80	80
Twin City Rapid Transit Co., Minneapolis (common)	104½	105
Union Traction Company of Indiana (common)	13	*13
Union Traction Company of Indiana (1st preferred)	83	*83
Union Traction Company of Indiana (2d preferred)	25	*25
United Rys. & Electric Company (Baltimore)	25⅜	25½
United Rys. Inv. Company (common)	17½	18
United Rys. Inv. Company (preferred)	34	35½
Virginia Railway & Power Company (common)	53½	a53½
Virginia Railway & Power Company (preferred)	93½	93½
Washington Ry. & Electric Company (common)	95	95
Washington Ry. & Electric Company (preferred)	90⅛	89
West End Street Railway, Boston (common)	70	70
West End Street Railway, Boston (preferred)	89	89
Westinghouse Elec. & Mfg. Company	66	67
Westinghouse Elec. & Mfg. Company (1st preferred)	107	110

*Last sale. a Asked.

ANNUAL REPORTS

Spokane & Inland Empire Railroad

The seventh annual report of the Spokane & Inland Empire Railroad, Spokane, Wash., shows that during the fiscal year ended June 30, 1913, the total operating revenue was $1,616,781, an increase of $15,727 over the previous year, or 0.96 per cent. The charges for operation increased $9,711, or 0.89 per cent. The average operating revenue per mile in 1912 was $7,782, in 1913 $7,619; the average operating expense per mile in 1912 was $5,200, in 1913 $5,186; the net operating revenue per mile in 1912 was $2,582, in 1913 $2,432; the taxes per mile in 1912 were $710, in 1913 $692, and the operating income per mile in 1912 was $1,872, in 1913 $1,740. The ratio of operating expenses to the total operating revenue was 66.82 per cent in 1912, as compared to 68.07 per cent in 1913, and the ratio of taxes to the total operating revenue decreased from 9.12 per cent in 1912 to 9.09 per cent in 1913.

The complete comparative statement of income, profit and loss of the company for the fiscal years ended June 30, 1912 and 1913, follows:

	1912	1913
Operating revenue:		
Freight	$313,012	$336,813
Passenger	638,621	565,703
Street railway system	545,529	550,046
Other revenue	135,347	164,219
Total	$1,632,509	$1,616,781
Operating expenses:		
Maintenance—way and structures	$223,561	$226,161
Maintenance—equipment	166,979	179,958
Traffic expenses	27,197	24,935
Conducting transportation	505,654	512,139
General expenses	167,412	157,322
Total	$1,090,803	$1,100,515
Net operating revenue	$541,706	$516,266
Taxes accrued	149,000	147,000
Operating income	$392,706	$369,266
Other income	.....	4,936
Total income	$392,706	$374,202
Deductions:		
Interest on funded debt	$245,168	$241,542
Interest on unfunded debt	195,538	210,190
Miscellaneous	22,167	999
Total	$462,873	$452,731
Deficit	$70,167	$78,529

J. H. Young, president of the company, says in part: "The total mileage of the system as of June 30, 1913, is: main line track, 215.58 miles; second track, 30.31 miles, and yard tracks and sidings, 48.04 miles. During the year 2.46 miles of extensions were made.

"The interurban freight business during the past year shows an increase of $23,801, or 7.6 per cent over the freight revenues of last year.

"The interurban passenger business shows a decrease of $72,917, or 11.41 per cent as compared with last year. This decrease was nearly all on the Cœur d'Alene division, owing partly to a late spring and the poor attendance at the Alan races. The revenue received from other sources, mainly from the sale of power, shows a substantial increase over last year's figures.

"The taxes of the company in the State of Washington were increased from $65,847 in the year 1910 to $123,813 in 1911 and to $126,441 in 1912. This increase was based on a higher assessed valuation of the company's property, which the attorneys believed to be unjustified. Litigation with respect to these taxes is in progress.

"The power plant of the company at Nine Mile on the Spokane River has a maximum capacity of 20,000 hp, with a continuous capacity of 15,000 hp, and is furnishing for the operation of the Inland division from 4000 to 5500 hp. The power contract with the Washington Water Power Company, entered into when our line was constructed, has yet three years to run. The company is using under this contract 3800 hp, the minimum amount permitted by the contract. This power is used on the Cœur d'Alene and Traction divisions. The Traction division is using from 2500 hp to 3000 hp, and the Cœur d'Alene division about 1200 hp, furnished by the Nine Mile plant.

"The company is selling about 4500 hp for commercial and irrigation purposes, for which it is receiving an average of $4 per hp per month. The revenue from the sale of commercial power shows an increase of about 50 per cent over last year.

"Recently the company entered into a contract for the delivery of 3000 hp, which will produce a revenue of $35,000 per year. This contract is for secondary power, which will be delivered during the eight or nine months of the year when the flow of water in the river is above the minimum upon which the continuous output of the plant is based.

"The company has two high-tension lines from Nine Mile to Spokane, constructed over its private right-of-way, either of which is capable of carrying the entire output of the plant, insuring continuity of service in case of damage or accident to one of the lines.

"No extensions have been made to the 66,000-volt high-tension power line during the past year, the 68 miles now in operation being capable of supplying the present and prospective business for several years.

"The total expenditure for additions and betterments during the fiscal year ended June 30, 1913, amounts to $150,416. This includes the purchase of additional right-of-way adjoining the freight terminals in Spokane, necessary in order to secure an advantageous trade with the city, and also the vacation of certain streets, $26,509; traction line extension and paving in Spokane, $64,665; installing a motor generator set in the Greenacres substation, $27,742; filling Inland bridge and building new culverts, $13,000, and miscellaneous, $18,497.

Eastern Pennsylvania Railways

The Eastern Pennsylvania Railways, Pottsville, Pa., reports gross earnings for its fiscal year ended June 30, 1913, of $769,680, which is an increase of 10 per cent over the previous year. The operating expenses, including taxes, amounted to $436,000, which is a slight decrease over the operating expenses of the previous year, leaving net earnings of $333,676, or an increase of approximately 28 per cent. The total surplus after all fixed charges and available for dividends on preferred and common stock amounted to $118,373. The company is now earning approximately one and three-quarter times its bond interest.

The complete comparative statement of income, profit and loss for the years ended June 30, 1912 and 1913, follows:

	1913	1912
Gross earnings	$769,680	$699,306
Operating expenses (including taxes)	436,004	438,593
Net earnings	$333,676	$260,713
Interest on bonds and notes, and rentals	215,303	214,246
Surplus	$118,373	$46,467

Another Modified Buffalo & Lake Erie Traction Company Reorganization Plan

Another modified plan for the reorganization of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., and the acquirement by the organized company of the capital stock of the proposed Canadian-American Power Corporation was submitted to the minority bondholders at a recent hearing in Albany before the Public Service Commission of the Second District of New York. Under the new plan, the reorganized Buffalo & Lake Erie Traction Company will not acquire the capital stock of the Buffalo, Lockport & Rochester Railway. The minority bondholders are also opposing the acquirement by the reorganized company of the capital stock of the Canadian-American Power Corportation, which proposed to import 46,000 hp energy from Niagara Falls, Ont., for car operation and for distribution to individual customers. The minority bondholders declare that this corporation merely has a contract from year to year to import this electrical energy and that it has been overcapitalized at $3,000,000.

The minority bondholders have decided to draw up a plan to present to the commission when the next hearing is called. Among those who appeared for the reorganization plan at this hearing were Thomas Penney, former president of the International Railway, and Edward G. Connette, the present president of the Buffalo traction lines, and auditors, engineers and lawyers from Buffalo and New York.

Reduction of Dividend by Denver & Northwestern Railway

The directors of the Denver & Northwestern Railway on Oct. 6 reduced the quarterly dividend from 2 per cent to 1 per cent. The following statement was issued by the company:

"The reduction in dividends from 2 per cent to 1 per cent has been deemed prudent and advisable after a thorough consideration of existing conditions. The tax assessment on the property of the Denver City Tramway and its subsidiary companies has been increasing constantly for several years past, until from an assessment of $4,080,000 in 1911 an attempt has been made to tax the company on $18,809,700 in 1913, although the acquisitions of the company are less than they were in 1910. The sinking fund requirements under the first refunding mortgage become operative in the coming year and ample and timely provision must be made for setting aside reserves beginning on Nov. 1, 1913. Owing to the unsatisfactory condition of the bond and money market during the last two years, bonds which have been accumulating on account of improvements and additions and which are now in the treasury could not be sold except at a price much less than their intrinsic value. This has caused temporary financing and an increase of floating debt secured by such bonds and other property. The net earnings for the twelve months ending Jan. 31, 1913, have been sufficient to deduct interest charges, taxes and other fixed charges and to continue the old dividend rate, but it has seemed best to reduce the dividend rate until the floating debt shall be materially reduced by the sale of treasury bonds and other free assets of the tramway and its subsidiary companies."

William G. Evans has resigned as president of the Denver City Tramway and C. K. Boettcher has been elected chairman of the board of directors of the company.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—Three applications have been received by the Public Service Commission for the Second District of New York from the Canadian-American Power Corporation, of which Edward G. Connette, president of the International Railway, Buffalo, is a director. The company was organized some time ago to be taken over by the Buffalo & Lake Erie Traction Company, after that company is reorganized under the plan now before the commission. The first application is for permission to issue $935,000, par value, of its 8 per cent cumulative preferred stock and $2,999,500, par value, of its common stock. The corporation has a total authorized capital stock of $4,000,000, consisting of 40,000 shares of the par value of $100 each, of which 10,000 shares is preferred stock and the remainder common stock. Secondly, the corporation desires to issue an amount of its authorized preferred stock of the aggregate par value of $435,000 to acquire $100,000 par value of the stock of the Niagara Falls Electrical Transmission Company, $59,700 of the funded indebtedness of the transmission company and $510,766.79 of its other obligations, being all the stock and indebtedness of the transmission company. These applications are designed to dissociate the Buffalo & Lake Erie Traction Company reorganization plan from any substantial relation to the electrical contract. A public hearing on these applications will be held by the commission in Buffalo on Oct. 24.

Fresno, Hanford & Summit Lake Interurban Railway, Fresno, Cal.—The Railroad Commission of California has granted authority to the Fresno, Hanford & Summit Lake Interurban Railway to issue $225,000 of preferred stock. Of this $100,000 is to be used to retire a previous issue of bonds, $50,000 is to be used for work on the railroad between Fresno and Selma, and the balance is to be used to defray indebtedness.

Galveston-Houston Electric Company, Galveston, Tex.—At a special meeting of the stockholders of the Galveston-Houston Electric Company on Oct. 6 at Portland, Me., the authorized capital stock was increased from $7,000,000 to $9,000,000 by the addition of $1,000,000 each of common and preferred. There was formerly outstanding $3,000,000 preferred and $4,000,000 common, as noted in the Electric Railway Journal of Oct. 4, 1913. The new stock will be sold from time to time to provide funds for various extensions and improvements to the street railway system in Galveston and Houston, as well as to the interurban line between the two cities.

Idaho-Oregon Light & Power Company, Boise, Idaho.—The New York protective committee of the first and refunding bonds of the Idaho-Oregon Light & Power Company, of which Samuel L. Fuller is chairman, has issued a statement to the bondholders, calling attention to what the committee states are "false and misleading reports" put forth by the Chicago protective committee in regard to the compensation and non-activity of the officers of the company, the compensation of counsel employed, and the sufficiency of the earnings of the Idaho Railway Company with reference to the payment of its interest charges. In connection with the reorganization of the property, it is stated that more than 75 per cent of the first and refunding bonds have been deposited with the New York committee, and the court has set Dec. 1 as the date for the foreclosure sale, which is the result of a suit brought by the State Bank, Chicago, Ill., as trustee for the bondholders, as noted in the Electric Railway Journal of July 19, 1913.

Interborough Rapid Transit Company, New York, N. Y.—The stockholders of the Manhattan Elevated Railway will vote on Nov. 12 on making a second mortgage to secure not exceeding $5,409,000 of second mortgage 4 per cent bonds. These, in compliance with the provisions of the lease of 1903, will be turned over to the Interborough Rapid Transit Company on expenditures for improvements and additions made and to be made. The new mortgage will cover the greater part of the property and franchises now owned and hereafter acquired.

Ithaca (N. Y.) Street Railway.—Edward N. Jackson, referee, will sell at foreclosure at Ithaca, N. Y., on Dec. 2 the mortgaged premises and property, rights, interests and franchises of the Ithaca Street Railway, as the result of a decree entered in an action brought by the Columbia-Knickerbocker Trust Company, New York. The property includes 250 shares of the capital stock of the Cayuga Lake Electric Railway and 500 shares, the entire capital stock, of the Ithaca & Cayuga Heights Railway.

Jamestown, Chautauqua & Lake Erie Railway, Jamestown, N. Y.—A. N. Broadhead and S. A. Broadhead, Jamestown, N. Y., who have acquired the Jamestown, Chautauqua Lake & Lake Erie Railroad, will change the name of the company to the Jamestown, Westfield & Northwestern Railway. Electric locomotives will be used for motive power. The Broadhead interests own and control the Jamestown Street Railway and the Chautauqua Traction Company.

Lake Erie & Youngstown Railway, Youngstown, Ohio.—It is said that London and Paris interests have arranged to take $4,500,000 of the bonds of the Lake Erie & Youngstown Railway. The company has asked the Public Utilities Commission of Ohio for permission to sell the bonds at not less than 75. They bear 5 per cent interest at par. Under a previous order, the bonds were not to be sold but were to be turned over to the Caldwell Construction Company, Cleveland, in payment for the construction of the road.

Monongahela Valley Traction Company, Fairmont, W. Va.—A dividend of 1½ per cent has been declared on the $5,000,000 of common stock of the Monongahela Valley Traction Company, payable on Nov. 1 to holders of record of Oct. 27. This compares with an initial dividend of 2 per cent paid in January, 1913, and a second dividend of 1½ per cent paid in July last.

New York (N. Y.) Railways.—An attempt to reopen the reorganization of the Metropolitan Street Railway and its subsidiaries into the New York Railways was made on Oct. 10, when a suit in equity was brought against the companies and the Central Trust Company, New York, in the Federal District Court by the bondholders of the Twenty-eighth & Twenty-ninth Streets Crosstown Railroad. The purpose of the suit is to protect the $1,500,000 of bonds of the crosstown company which were guaranteed by the Metropolitan Street Railway when the latter took the road over in 1896. On the basis of the guarantee the bondholders in February, 1910, obtained a deficiency judgment for $1,745,344. In the suit of equity now brought they ask that the transfer of property, assets, etc., of the old

Metropolitan Street Railway made at the time of its reorganization in 1911 be declared void and that the property thus returned to the Metropolitan Street Railway be sold under the direction of the court to satisfy the deficiency judgment.

Northern Ohio Traction & Light Company, Akron, Ohio.—Borton & Borton, Cleveland, are offering 6 per cent cumulative preferred stock of the Northern Ohio Traction & Light Company, of which $3,000,000 in all has been approved by the Ohio Public Utility Commission and $2,640,000 has been sold. The company reports the sale of $300,000 of 4's and $35,000 of Canton-Akron consolidated guaranteed 5's.

Oakland (Cal.) Railways.—On Sept. 29 R. G. Hanford withdrew his suit to enjoin the renewal of the $2,500,000 note of the San Francisco-Oakland Terminal Railways, dated Aug. 12, 1912, to Aug. 12, 1913. Arrangements are under way to borrow $500,000 for betterments and new construction work and to extend until Sept. 12, 1914, this $2,500,000 note and to continue the guarantee on the $1,100,000 of Oakland Terminal notes which matured on Aug. 20, 1913. The shareholders of the Oakland Railways will vote on Dec. 11 on the following propositions: (1) Confirming an indebtedness of $2,500,000 of 6 per cent notes dated Aug. 12, 1912, and the liability under its matured guarantee of the $1,100,000 notes on the Oakland Terminal Company. (2) Increasing such indebtedness to the sum of $14,100,000. (3) Ratifying the payment of $2,500,000 notes on Sept. 12, 1914.

Public Service Company of Northern Illinois, Streator, Ill.—The Public Service Company of Northern Illinois has declared a quarterly dividend of 1¼ per cent on the common stock, an increase of three-quarters of 1 per cent from previous declarations. It has also declared a regular quarterly dividend of 1½ per cent on the preferred stock. Both dividends are payable on Nov. 1 to stock of record Oct. 18.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A special meeting of the stockholders of the Puget Sound Traction, Light & Power Company will be held in Boston, Nov. 3, to vote on the proposition of authorizing the issue and sale of $2,686,000 of the already authorized but unissued preferred stock. To provide for financing extensions, additions and improvements necessitated by demands of growing business, and for refinancing the two-year 5 per cent mortgage notes at maturity on Feb. 1, 1914, the directors believe that at least a portion of the necessary funds should be obtained through the sale of preferred stock. If the issue is authorized at the meeting, holders of each eleven shares of stock, whether preferred or common, will consequently be entitled to subscribe at par for one share of additional preferred.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The shareholders of the San Francisco-Oakland Terminal Railways will vote on Dec. 10 on the following matters: (1) Increasing the bonded debt which now consists wholly of bonds issued by other corporations whose properties the said corporation has acquired from the amount now existing, about $20,184,000, to $21,184,000. (2) Ratifying the indebtedness of the corporation represented by a promisory note of $25,000,000 heretofore issued by it and payable to the Oakland Railways and also represented by a promisory note of $128,814, heretofore issued by the Oakland Traction Company and for the payment of which note the San Francisco-Oakland Terminal Railways has become liable and which note is payable to the United Properties Company. (3) To increase the indebtedness of the corporation so represented by the said $2,628,814 of promissory notes payable to the Oakland Railways and to the United Properties Company to the sum of $3,128,814, i. e., by $500,000. (4) To renew or extend the time of payment for all or any of such promissory notes. The new bonds and notes presumably are to be used as a collateral in connection with the renewal of $3,600,000 of notes of the United Properties Company system and the issuance of $500,000 of additional notes.

Southwestern Traction & Power Company, New Orleans, La.—A mortgage for $5,000,000 has been filed to secure an issue of bonds of the Southwestern Traction & Power Company providing for the construction of an electric railway between Berwick and Lafayette. The mortgage is a prior lien on all holdings of the traction company and is executed to the Whitney-Central Trust & Savings Bank, New Orleans, and the Continental and Commercial Trust and Savings Bank, Chicago, as trustees.

Third Avenue Railway, New York, N. Y.—The annual meeting of the stockholders and registered owners of adjustment income mortgage bonds of the Third Avenue Railway will be held on Nov. 12, at which action will be taken upon a joint agreement made by the directors of the company and the directors of the Kingsbridge Railway for the consolidation of the two corporations. On Nov. 12 the stockholders of the Kingsbridge Railway will hold their annual meeting and vote upon the proposed agreement for the consolidation of the company with the Third Avenue Railway.

Titusville (Pa.) Electric Traction Company.—On the application of Charles Pfizer, a creditor and stockholder, Judge Prather has named William J. Smith as receiver of the Titusville Electric Traction Company, with bond fixed at $10,000.

Twin City Traction Company, Dennison, Ohio.—The Twin City Traction Company has been authorized to sell to the Ohio Service Company all its assets and physical property, real, personal and mixed, and also all franchises, contracts and rights owned and used by the Twin City Traction Company in the cities of Dennison and Uhrichsville. The Ohio Service Company is to pay therefore the agreed sum of $100,000. The application made to the commission regarding this purchase was noted in the ELECTRIC RAILWAY JOURNAL of Oct. 11, 1913.

ELECTRIC RAILWAY MONTHLY EARNINGS

AMERICAN RAILWAYS, PHILADELPHIA, PA.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1 mo.	Sept.	'13	$457,683	.....	.....	.....	.....
1 "	"	'12	428,771	.....	.....	.....	.....
3 "	"	'13	1,476,610	.....	.....	.....	.....
3 "	"	'12	1,352,432	.....	.....	.....	.....

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

1 mo.	Aug.	'13	$210,926	*$113,899	$97,028	$34,096	$62,932
1 "	"	'12	198,145	*102,935	95,211	32,106	63,105
2 "	"	'13	419,677	*229,689	189,988	67,558	122,430
2 "	"	'12	390,899	*205,231	185,668	64,143	121,525

CLEVELAND, PAINESVILLE & EASTERN RAILROAD

1 mo.	Aug.	'13	$48,985	*$23,382	$25,603	$10,415	$15,188
1 "	"	'12	44,928	*21,497	23,431	9,852	13,579
8 "	"	'13	283,526	*153,718	129,809	83,356	46,452
8 "	"	'12	265,362	*152,332	113,031	79,233	33,798

JOPLIN & PITTSBURG RAILWAY, PITTSBURG, KAN.

1 mo.	Sept.	'13	$48,428	*$29,200	$19,228	$12,542	$6,686
1 "	"	'12	43,914	*24,924	18,990	12,542	6,448
12 "	"	'13	569,755	*340,761	228,994	150,500	78,494
12 "	"	'12	515,908	*303,272	212,636	153,885	58,751

KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY.

1 mo.	Aug.	'13	$79,458	$41,613	$37,846	$20,504	$17,342
1 "	"	'12	70,233	40,033	30,199	16,594	13,605
2 "	"	'13	145,439	75,045	70,394	40,918	29,476
2 "	"	'12	136,005	79,719	56,286	32,738	23,548

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1 mo.	Aug.	'13	$163,244	*$76,218	$87,027	$35,312	$51,715
1 "	"	'12	147,888	*72,780	75,108	35,188	39,920
8 "	"	'13	942,468	*558,764	383,704	280,993	102,711
8 "	"	'12	872,778	*500,215	372,563	279,249	93,314

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

1 mo.	Sept.	'13	$164,620	$59,599	$105,022	$47,224	$57,798
1 "	"	'12	136,192	52,784	83,408	43,161	40,247
12 "	"	'13	1,739,737	730,670	1,009,068	547,638	461,430
12 "	"	'12	1,461,503	636,048	825,456	495,581	329,875

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1 mo.	Sept.	'13	$1,999,344	$1,154,067	$845,277	$801,002	$44,275
1 "	"	'12	1,926,044	1,127,154	798,890	762,039	36,851
3 "	"	'13	5,965,989	3,502,557	2,463,432	2,398,647	64,785
3 "	"	'12	5,758,079	3,429,346	2,328,733	2,277,322	51,412

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1 mo.	Aug.	'13	$261,522	*$156,650	$104,872	$43,774	$61,098
1 "	"	'12	227,514	*137,504	90,010	43,912	46,098
8 "	"	'13	1,941,363	*1,191,472	749,891	361,786	388,105
8 "	"	'12	1,702,158	*1,039,395	662,764	353,469	309,295

VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA.

1 mo.	Aug.	'13	$446,924	$224,521	$222,402	$132,555	$89,847
1 "	"	'12	416,857	207,513	209,344	123,864	85,480
2 "	"	'13	894,400	442,443	451,957	265,206	186,751
2 "	"	'12	832,585	419,228	413,357	246,852	166,505

*Includes taxes.

Traffic and Transportation

Fare Changes in British Columbia

The following statement has been issued by R. H. Sperling, general manager British Columbia Electric Railway, Vancouver, B. C., in regard to the fare changes which went into effect on Sept. 18:

"As it is well known, there has been a steady increase in the cost of labor and supplies for some years past. Everything the company buys—labor, electrical equipment, rails, rolling stock and material of every kind—has grown in value until a proper relation no longer exists between the cost of a street-car ride and the price paid for it. To the people at large the cost of practically every necessary commodity has also advanced, excepting only the street-car ride, which has remained the same. On the other hand, the wages of all classes of labor, skilled and unskilled, have increased step by step with the cost of living. No such compensating advantage has come to the company; consequently the margin between operating cost and revenue earned has gradually decreased until the profit earned by the company on its investment is no longer adequate to induce the investor to put fresh capital, so necessary for the development of the territory served by the company, into the concern. Apart, however, from the viewpoint of obtaining additional capital, the company has not earned a reasonable profit on its operations during the past eighteen months, certainly no such return as would induce local people to invest their savings in the enterprise.

"The company's investment in British Columbia amounts to approximately $45,000,000, consisting entirely of cash received from its stockholders, which is at present earning about 4½ per cent per year. If the necessary further capital required for the adequate development of the territory served by the company is to be raised on reasonable terms, it is absolutely essential that the company's railway revenue should be increased.

"Although the necessity of abolishing commutation rates has been apparent for some time, we have repeatedly postponed action, hoping for an adjustment in economical conditions that would render any change unnecessary. No such adjustment has come and none is in sight. Therefore to further delay setting the company's affairs in line with conditions as they now exist, and are certainly to continue for some time, would be not only unfair to those who have furnished money for our development, but dangerous and unsound from a financial standpoint.

"The situation which confronts us in British Columbia has been experienced generally along the Pacific coast and in a number of cases elsewhere has been met by a return to the straight 5-cent fare. Our company, however, does not intend to go to this extreme unless a still further increase in operating costs compels us. We propose, therefore, to continue a low-rate ticket for workingmen, which will be sold in strips of ten—five white and five green—at 40 cents a strip, or 4 cents a ride. The white tickets will be good only up to 8 a. m. The other half will be good at any time up to midnight, when the 'owl' rates will come into effect, where 'owl' cars are run. Apart from these tickets the fare will be 5 cents, but for the convenience of the public blocks of tickets will be sold, five for 25 cents. School children's rates will remain as before."

Accident Lecture and Moving Pictures in Brooklyn

On Oct. 21 a special meeting of representatives of the transportation department of the Brooklyn Rapid Transit System was held at the company's offices to attend a display of the material which has been gathered to warn the public against accidents and to hear Mrs. J. P. McCall, who has been lecturing in the public schools to children in the interests of the Brooklyn Rapid Transit children's safety crusade. Mrs. McCall gave a typical lecture, showing how the interest of the children was aroused and maintained by stories and apt illustrations, by accounts of the duties of the motorman and conductor and by direct questions. Mrs. McCall also showed a set of posters covering different kinds of accidents. These posters she displayed on an easle. Her lectures are usually thirty to forty minutes in length. Mrs. McCall's talk was followed by a display of a moving picture entitled "The Price of Thoughtlessness," the story for which was prepared by E. C. Clark, supervisor of inspection in charge of accident work, Brooklyn Rapid Transit System, and Roy T. Hanaford, of the Vitagraph Company. The latter company will place this film on its regular circuit and is prepared also to rent it to electric railways either direct or through the medium of the General Film Company. The film begins with a reproduction of an accident prevention lecture in a schoolroom in which the car models and posters are displayed. The next scene shows how one of the boys of the class on seeing a broken trolley wire informs a policeman, who calls up the line department of the railway. The following scenes show the emergency wagon leaving headquarters, the linemen making the repairs and the boy receiving the praise of the bystanders. Other scenes show how children are injured while playing in the streets and the unhappiness that comes to crippled youngsters who can no longer indulge in games with their friends. This reel has made such an excellent impression that it is planned to prepare others of similar character. One way that the company's lectures are being used to maintain the interest of the children in the accident question is to have the pupils write compositions on some form of accident which has come within their experience. In line with this idea Public School 147, Brooklyn, recently made an issue of its paper a "Safety" number.

Changes in Schedule Ordered in Madison.—The Railroad Commission of Wisconsin has issued an order directing the Southern Wisconsin Railway to reduce the headway of its cars on the principal lines of its system in Madison and to extend its schedule to a later hour at night.

Fare Boxes to Be Tested in Columbus.—Fare boxes will be tested on cars of the Oak Street and the High Street lines of the Columbus Railway & Light Company, Columbus, Ohio. So far fares have been collected by the conductors, who stand at the entrance of the pay-as-you-enter cars.

City Cars to Have Right-of-Way Over Interurbans at Detroit.—A resolution was adopted by the Common Council of Detroit, Mich., on the evening of Oct. 7, instructing the Detroit United Railway to give the city cars the right-of-way over interurban cars and to cease switching city cars out of the way for interurban cars.

Inquiry Into Height of Car Steps.—The Public Service Commission of New Hampshire has concluded the taking of testimony in connection with the hearings which it has conducted to inquire into the question of the height of the steps of the cars operated on the Concord and Manchester electric branch of the Boston & Maine Railroad.

Service Order in Phoenix.—The Corporation Commission of Arizona has issued an order to the Phoenix Railway for additional service upon all lines except the Glendale line. The order is in the form of a judgment to a complaint, the complaint being made by the commission of its own motion, as is allowed under the corporation code of the State.

Newspaper Publicity Campaign in Springfield, Ill.—The Springfield (Ill.) Consolidated Railway is conducting a newspaper publicity campaign designed to create a good feeling upon the part of the public. Reminiscent advertisements relate the rapid development of the system and the large amounts paid out in the city for help, fuel and other necessities.

A Suggestion to City Officials of Elgin.—Edwin C. Faber, vice-president and general manager of the Aurora, Elgin & Chicago Railway, has notified the City Council of Elgin, Ill., that the present system of a central transfer station for street cars appears more satisfactory than through routing or a short loop in the business district. An opinion is asked from the city officials.

Order in Regard to Drinking Cups in California.—The Railroad Commission of California has issued a general order directing all steam and electric railways of the State to provide sanitary individual drinking cups for passengers at a cost not to exceed 1 cent a cup. These cups must be provided on all trains whose schedule between terminals exceeds one hour and thirty minutes.

I. C. C. Refuses to Open Commuters' Case.—The Interstate Commerce Commission has refused to reopen the Connecticut commuters' fare case as asked by Connecticut Commuters' League. The commission three months ago fixed commutation rates between New York City and Connecticut at approximately 8 per cent less than former rates, and the commission believes these rates are reasonable.

Railway Permitted to Operate Bus Line.—The Public Service Commission of the Second District of New York has issued an order permitting Nathan A. Bundy, receiver for the Buffalo Southern Railway, which operates an electric railway between Buffalo, Hamburg, East Aurora and Armor in western New York, to operate a stage route or bus line from the terminus of the tracks of the Buffalo Southern Railway at East Seneca to East Aurora.

Street Car Ticket Hearing Closed.—The State Public Service Commission of Washington has closed its hearing in reference to the selling of tickets on the cars of the Puget Sound Traction, Light & Power Company. The privilege has been granted to James B. Howe, attorney for the company, to introduce later additional testimony of H. L. Gray, formerly chief engineer of the commission, into the records. The commission has reserved its decision.

Near-Side Stops in Rochester.—The number of street corners at which the Rochester street cars stop on the near side is to be greatly increased under a new order which will go into effect immediately. Elmer E. Strong, superintendent of transportation of the New York State Railways, Rochester Lines, announces that he believes the near-side stop not only operates to secure better service in the down-town business district, but makes for greater safety.

Ordinance Passed Requiring Two Men on Near-Side Cars.—The Common Council of Lockport, N. Y., has voted to compel the International Railway, Buffalo, to place two men instead of one in charge of its new near-side cars on the local lines of Lockport. The chief of police has been directed by the board to enforce an ordinance covering this matter or to collect a penalty of $25 from the International Railway for every twenty-four hours the cars are operated by one man.

Clerks and Conductors in Ticket Fraud.—Two clerks and six conductors employed by the International Railway, Buffalo, N. Y., have been arrested by central office detectives charged with stealing books of street car tickets and selling them at reduced prices. In the arrest of the employees the officers of the company believe they have the parties who have been conducting a systematic business in street car tickets for some time. The prisoners have been held for the grand jury.

Decision Reserved in Complaint Against Chautauqua Traction Company.—Commissioner Hodson of the Public Service Commission for the Second District of New York has reserved decision on the complaint against the Chautauqua Traction Company, brought by Buffalo and Jamestown members of the Order of United Commercial Travelers of America, in which it is alleged the company does not provide proper toilet conveniences on its cars for the accommodation of the traveling public.

Improved Service for South Boston.—The Boston (Mass.) Elevated Railway inaugurated a new service between the down-town district and the South Boston peninsula on Oct. 18 by establishing a rush-hour schedule at morning and night over the Summer Street extension, and providing an air-line route through L Street and First Street to City Point. The company has provided an outbound morning service of twenty-three trips and an inbound service of twenty-six trips in the afternoon between Dewey Square and South Boston. The new facilities greatly improve the transit conditions in the wholesale and marine district east of the South Station, besides cutting down the time of transit between City Point and the business center of Boston. The service relieves congestion in the Broadway lines of the company.

Exhaust Fans in Philadelphia Cars.—To insure adequate ventilation when the car is at a standstill, particularly in sultry and muggy weather, the near-side cars of the Philadelphia Rapid Transit Company are being equipped with an electrically driven exhaust fan which the conductor can, when conditions require, start in motion and draw air out through an opening in the rear of the car. A large number of the near-side cars in Philadelphia now have the air intake located in the roof instead of in the floor, and the remainder are being changed as rapidly as service conditions will permit. Every car of the company is thoroughly cleaned and disinfected at the carhouse at least once a day, and in addition a broom is provided on each car for sweeping the floor and steps.

Through Routes and Joint Rates Between Louisville and Indianapolis.—In a circular issued to its members the Board of Trade of Louisville, Ky., declares that electric railways affected by the recent order of the Interstate Commerce Commission requiring them to adopt joint routes and through rates between Louisville and Indianapolis have not complied fully with the order. The chief complaint which the board of trade makes is in regard to insufficient facilities for handling freight offered at the Louisville terminals of the Louisville & Northern Railway & Lighting Company and the Louisville & Southern Indiana Traction Company. Shippers have been urged to report cases of delays or refusal to accept shipments in order that appeal may be made to the commission. It is expected that the new through rates will be filed Dec. 1, effective on Jan. 1, 1914.

"Safety First" Results in Rochester.—Since the inception of the "safety first" movement by the New York State Railways, Rochester Lines, there has been a notable decrease in the number of accidents. A detailed record started six months ago shows that although the number of employees has increased the number of accidents has decreased. Victor T. Noonan has prepared an interesting chart which shows the comparative number of employees and accidents. This record is more remarkable because of the large amount of construction work which has been carried on. Certain kinds of minor accidents have been eliminated altogether. During April, May and June 1369 men were employed, and in twelve departments there were ninety-five accidents. During July, August and September 1439 men were employed, or an increase of seventy, but during that time there were only eighty-two accidents, a decrease of thirten.

Answer to Fare Complaint Filed.—The Washington & Old Dominion Railroad, Washington, D. C., has filed with the Interstate Commerce Commission its brief in answer to the complaint made by S. T. J. Price and others attacking commutation rates on the Great Falls branch. The railway, through its attorney, asserts that at no time has it been able to earn from its tariffs what "under the law it is entitled to earn—that is to say, that operating expenses are scarcely met, allowing nothing for depreciation, maintenance, betterments and interest on investment; that nothing had been paid by way of dividend or earned for it by way of dividend, even with the most economical management of the property, and that the rates charged by the increased tariff were in every instance such as were authorized and justified under the laws in force in the State of Virginia, where all but about 1500 ft. of the 14 miles of the Great Falls branch is located." The company has asked that the complaint be dismissed.

The Denver Skip-Stop Explained.—John A. Beeler, vice-president and general manager of the Denver (Col.) City Tramway, has sent a letter to Commissioner Otto Thum explaining the express and skip-stop service on Colfax Avenue. Mr. Beeler says that the company has been commended for inaugurating the new service, which has proved a great time-saver for many who use the line. He says further: "The plan cannot have proved a serious detriment to anyone, for the reason that if persons are obliged to walk one block to board the car, on the return trip they are discharged at their own particular street. Even with the skip-stop method in effect on Colfax Avenue the stops average about eight to the mile, which is the average number of stops in effect on Broadway and parallel streets, on account of the difference in the size of the blocks. All who work desire to save time in going to and from work. It is our desire to do everything we can to make street car travel more convenient, more popular, safer and better in every way, but if this skip-stop plan is not approved by the majority we will abandon it."

Personal Mention

Mr. S. Anderson, manager of the New London division of the Shore Line Electric Railway, Norwich, Conn., has been appointed general manager of the Norwich & Westerly Traction Company.

Mr. Alba H. Warren, who has been the general manager of the Pensacola (Fla.) Electric Company for the last five years, has been transferred to the Galveston (Tex.) Electric Company as manager.

Mr. J. A. Coe, formerly superintendent of the Muscatine North & South Railway, Muscatine, Ia., has been appointed superintendent of transportation of the Inter Urban Railway, Des Moines, Ia., to succeed Mr. G. T. Gadsby, resigned.

Mr. Dwight H. Peck, freight agent for the Norwich & New York Property Company for the last eight years, has been made general freight agent of the Norwich & Westerly Traction Company and the Shore Line Electric Railway, Norwich, Conn., effective on Nov. 1, 1913.

Mr. T. J. Hanlon, Jr., has been appointed general manager of the Pensacola (Fla.) Electric Company, to succeed Mr. Alba H. Warren, who has been appointed manager of the Galveston (Tex.) Electric Company. Mr. Hanlon has been with Stone & Webster for six years, serving part of that time at Dallas, Tex. He was superintendent of the railway department of the Pensacola Electric Company under Mr. Warren.

Mr. J. Walter Gillette has resigned as treasurer, general manager and purchasing agent of the Fort Smith Light & Traction Company, Fort Smith, Ark., effective on Nov. 1. Mr. Gillette has been connected with the company at Fort Smith for a number of years. He was elected president of the Arkansas Association of Public Utility Operators in the spring of 1913 and is a full member of the American Institute of Electrical Engineers.

Mr. Claude K. Boettcher of the firm of Boettcher, Porter & Company, Denver, Col., has been elected chairman of the board of directors of the Denver (Col.) City Tramway. Mr. Boettcher has been a director of the company since June, 1913. He was a member of the syndicate which early in 1913 purchased the holdings of Marsden J. Perry, Providence, R. I., in the Denver & Northwestern Railway, which owns the capital stock of the Denver City Tramway.

Mr. Charles C. Marshall, Sidney, Ohio, has been appointed a member of the Ohio Public Utilities Commission by Governor Cox to succeed Judge William L. Dechant, deceased. Mr. Marshall served as special counsel for the Public Service Commission under the appointment of Attorney-General Hogan and aided in formulating the bill creating the Public Utilities Commission. There years ago he was defeated for the congressional nomination in the Fourth District.

Mr. C. Peter Clark has been appointed chief of the rate and tariff bureau of the Massachusetts Public Service Commission, with headquarters at Boston. Mr. Clark is a son of the late Charles P. Clark, former president of the New York, New Haven & Hartford Railroad, and is a native of Jamaica Plain, Mass. He has had a varied railroad experience, including service as general freight agent of the Old Colony Railroad and Fall River Line, general manager of the New York & New England Railroad and superintendent of the eastern division of the New York, New Haven & Hartford Railroad. Ten years ago he was appointed second vice-president and general manager of the Buffalo & Susquehanna Railroad and has since made his headquarters in Buffalo.

Mr. William G. Evans has resigned as president of the Denver (Col.) City Tramway. Mr. Evans is the son of the John Evans who founded Northwestern University at Evanston, which is named after him, and who was appointed Governor of Colorado by President Lincoln. John Evans founded the street railway system of Denver and his traits and character were inherited by his son, William, whom Isaac F. Marcosson, writing in *Munsey* for May, 1912, characterized as "the most dominating personality in Denver life." He is head of the local republican organization at Denver and is interested in the First National Bank, the International Trust Company and numerous other enterprises.

Mr. Allen F. Edwards has been elected vice-president of the Detroit (Mich.) United Railway in charge of purchases. Mr. Edwards was born in Oglethorpe County, Georgia, in 1876. He began his railroad career as cashier of the Yonkers (N. Y.) Railroad in 1897 and later served as superintendent. In 1898, after the property came into the control of the Union Railway and the Third Avenue Railroad, New York, he was appointed general superintendent. In 1899 Mr. Edwards assisted in building the electric railways at Petersburg, Va., and acted as general manager of the electric railway, electric lighting and water power companies there. In 1901 he was appointed general manager of the Toledo & Monroe Railway, then under construction between Toledo and Detroit. The same year he was made general manager of the Detroit & Toledo Shore Line Railroad of the Everett-Moore syndicate, also building from Toledo to Detroit. In 1902 the Detroit & Toledo Shore Line Railroad was placed in the hands of Mr. Edwards as receiver by the United States court. As receiver he completed the construction of the road to Detroit, when it was sold to the Grand Trunk and Clover Leaf Railroads. He then became connected with the Detroit United Railway as purchasing agent and has served that company continuously since. Mr. Edwards is also a director of the Union Trust Company, Detroit.

A. F. Edwards

Talk on Schedules

The following is an extract from an article, "Schedules Are Altered to Meet Conditions of Travel," which appeared in *Electric Railway Service* for Oct. 17, 1913, which is published in the interest of the Detroit (Mich.) United Railway:

"Street railway schedules are made to suit the conditions of travel. The schedules on one line to-day may not be sufficient for the needs of the patrons of that line a month from to-day, and it is just as true that business conditions may have changed so that the service rendered from to-day's schedules may be too great a month hence.

"Practically every city line has three schedules in operation at all times—week-day, Saturday and Sunday. These three schedules are necessary because the volume of travel and the hours of travel differ in these three periods. For example, on week-days (in street railway work this means Monday, Tuesday, Wednesday, Thursday and Friday) there is the early factory rush and the late afternoon rush. On Saturdays there is the early morning rush, but many factories close down at noon, thereby lessening the late afternoon rush. On Sundays travel is pretty well equalized.

"The summer travel in Detroit, with all the resorts in full blast and the children out of school every day, is vastly different from the winter travel, and hence summer schedules must of necessity supply a greater service than in the fall when the school bells ring daily.

"So that in changing schedules from time to time because of the seasons and because of changing business conditions the Detroit United Railway is proceeding upon proper lines.

"As our readers know, car miles mean the number of miles all the cars travel in performing their service. As schedules increase the number and frequency of cars the number of car miles increases. Here are comparisons as to the number of car miles within the city service zone:

"From Sept. 1 to 15, in 1912, the car mileage within the city service zone amounted to 1,221,248 car miles.

"From Sept. 1 to 15, in 1913, this car mileage amounted to 1,346,899 car miles.

"This is an increase of nearly 12 per cent."

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Washington-Virginia Railway, Washington, D. C.**—Chartered in Virginia to succeed the Washington Utilities Company, in accordance with the plan mentioned in the ELECTRIC RAILWAY JOURNAL for Oct. 11, 1913, page 707. Officers: Frederick H. Treat, Wayne, Pa., president, and J. B. Hoellman, Washington, D. C., secretary.

***Minneapolis Northwestern Electric Railway, Minneapolis, Minn.**—Incorporated in Minnesota to build an electric railway in Thief River Falls and the surrounding territory.

***Sultan (Wash.) Valley Railway.**—Incorporated in Washington to build an interurban railway from Sultan to the junction of the Sultan River and Williamson Creek. Capital stock, $500,000. Incorporators: J. C. Davis, J. Wigren and F. C. Thayer, Chicago, and Nate Jones, Sultan.

FRANCHISES

Globe, Ariz.—The franchise for an electric railway in Globe granted by the City Council to N. L. Amster and associates some time ago is to be revoked by the city according to the plans of the Mayor and Councilmen. Time for beginning of construction of the proposed line between Globe and Miami expired on Sept. 13.

Clovis, Cal.—F. S. Granger, Clovis, has received a franchise from the Council through Fifth Street, ending on the eastern city limits line in Clovis. This is part of a plan to build an electric railway from Fresno to Clovis and extending 8 miles beyond Clovis to the foothills of the Sierra Nevada Mountains. [E. R. J., Oct. 11, '13.]

Muscatine, Ia.—The Davenport-Muscatine Railway, Davenport, has asked the Council for a franchise for an extension to the site of a proposed freight depot in Muscatine.

New Orleans, La.—An ordinance providing for the sale of electric railway franchises in Broadway and South Claiborne Avenue in New Orleans will be presented at the next meeting of the City Council in New Orleans.

Hannibal, Mo.—The Hannibal Railway & Electric Company has asked the Council for a franchise on West Broadway between the east line of Hueston Street and the east line of Hawkins Avenue in Hannibal.

Albany, N. Y.—The Frontier & Western Railway has asked the Public Service Commission, Second District, for a certificate of public convenience and necessity. The proposed new line is to operate through Black Rock.

Hamilton, Ont.—The City Council has instructed City Engineer Macallum to prepare plans and specifications for a municipal inclined railway at Wentworth Street in Hamilton.

Gladstone, Ore.—Stephen Carver, Gladstone, has received a twenty-five-year franchise from the Council in Gladstone. This is part of a plan to build an electric railway through Gladstone. [E. R. J., Oct. 11, '13.]

Portland, Ore.—The Portland & Oregon City Electric Railway has received a franchise from the Council for a new line in Portland.

Chattanooga, Tenn.—The Eastern Tennessee Traction Company has received a franchise from the County Court for a system of interurban railroads radiating from Chattanooga. L. M. Coleman is interested. [E. R. J., June 14, '13.]

Tacoma, Wash.—C. E. Muckler and E. K. Murray, of the Tacoma-Seattle Electric Short Line Railway, have received a franchise from the Council for an extension of time on their franchise in which to enter Tacoma. [E. R. J., Oct. 11, '13.]

***Wenatchee, Wash.**—Hyman Harris, Wenatchee, has asked the Council for a franchise in Wenatchee.

TRACK AND ROADWAY

Medicine Hat (Alta.) Railway.—This company states that surveys have been completed and construction will be begun April 1, 1914, on its electric railway in Medicine Hat. The Montreal Engineering Company, Ltd., Montreal, has the contract to build the line. R. O. Sweezey, chief engineer. [E. R. J., Sept. 20, '13.]

Salt River Valley Electric Railway, Phoenix, Ariz.—Surveys have been made and preliminary arrangements are still under way by this company for its 20-mile line between Phoenix and Mesa. C. C. Lewis, Box 53, Phoenix, president. [E. R. J., Jan. 5, '13.]

Little Rock Railway & Electric Company, Little Rock, Ark.—Work has been begun by this company on the 2-mile extension of the Highland Park line to the Niemeyer Mills in Little Rock.

Fresno, Hanford & Summit Lake Interurban Railway, Fresno, Cal.—It is announced that bonds aggregating more than $200,000 have been voluntarily pledged by supporters of this company and that construction on the first unit from Fresno to Selma will be begun as soon as material can be secured. L. H. Jones, the engineer who has charge of the construction of this railway, is securing prices on poles and ties for the line.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—Grading and trestle work have been completed and rails have been laid to Alamo by this company on its Danville branch. The viaduct over the Southern Pacific Railroad tracks about 1 mile from Walnut Creek has been completed.

***San Bernardino, Cal.**—Plans for a municipal railway are being planned by Mayor Catick with the naming of City Engineer F. A. Smith as engineer in charge of the preparation of plans for the proposed new electric line along Seventh Street and Mount Vernon Avenue and thence northward in San Bernardino. The estimates will be secured and the Council announces that a bond election will be called as soon as possible.

Sacramento Valley West Side Electric Railway, Willows, Cal.—The Railroad Commission has issued a supplemental order upon the application of this company, giving it authority to spend $1,000 per month in organization work. C. L. Donohoe, Willows, president. [E. R. J., Oct. 11, '13.]

Connecticut Company, New Haven, Conn.—This company will soon lay new rails through Fairfield.

Okeechobee Interurban Railway, Arcadia, Fla.—This company has completed arrangements for a regular boat line from Lakeshore, the new town which will likely be the terminus of the line on Fisheating Creek near the lake, to the East Coast via the canals, thus giving a direct line across the State. E. Prouty, Arcadia, manager. [E. R. J., Oct. 18, '13.]

***Panama City, Fla.**—A. G. Chandlee, secretary of the Gulf View Land Company, states that a company is being formed to build a gasoline railway through East Millville to Panama City, 5 miles.

Atlanta & Carolina Railway, Atlanta, Ga.—The second suit for a receiver for this company, which was chartered to build a line from Atlanta to Augusta, has been filed in the Superior Court in Atlanta. The company has begun work on its line. [E. R. J., Sept. 27, '13.]

Idaho Falls (Idaho) Electric Railway.—Plans are being made by this company to begin soon the construction of its line through Idaho Falls and the adjacent country. J. L. Milner, Idaho Falls, president. [E. R. J., Oct. 11, '13.]

Chicago (Ill,) Railways.—The local transportation committee has granted this company till Jan. 1, 1915, to build extensions ordered for this year amounting to about 19 miles of single track.

Kankakee & Urbana Traction Company, Urbana, Ill.—Arrangements for extending this company's line from Urbana to Champaign and Mattoon are reported completed.

St. Joseph Valley Traction Company, Elkhart, Ind.—Right-of-way has been purchased and construction will soon be begun by this company on a 3½-mile extension between its present terminus and Columbus.

Indianapolis, Linton & Vincennes Traction Company, Indianapolis, Ind.—This company states that surveyors began the preliminary work on the line Oct. 9, starting from the Union Stock Yards, Indianapolis, to work out a feasible route from the city limits to Mooresville. It is the intention to have the survey completed by Dec. 1, so that all plans and profiles can be prepared by the first of the year. A meeting of the citizens of Linton, Ind., will soon be held to discuss with Gilmer Bray and W. C. Thompson, the president and secretary of the company, the question of their subscribing to $50,000 of the issue of $200,000 of stock which is being offered for sale to cover the cost of the survey and preliminary work. [E. R. J., Oct. 11, '13.]

Hutchinson (Kan.) Interurban Railway.—Work will be begun by this company on a new line to the Country Club and the soda ash plant as the result of the settlement of a lawsuit in its favor. The company will tear up a section of the old track, and this will be used in part in the construction of the new line.

Kansas Central Traction Company, Topeka, Kan.—A contract has been awarded by this company to Mayo & Luff, New York, N. Y., to build its line from Coffeyville to Parsons, through Edna, Oswego and Altamont. Philip Strack, Parsons, president. [E. R. J., Aug. 9, '13.]

***Wichita, Kan.**—Commercial organizations of Wichita are urging the construction of an electric line from Wichita to Pratt, Kan., via Kingman. Plans looking toward the financing of the work are now being considered. No names of those interested are yet given.

New Orleans Railway & Light Company, New Orleans, La.—The double-tracking of its lines on South Claiborne Street and Broadway in New Orleans is being contemplated by this company.

Orleans-Kenner Electric Railway, New Orleans, La.—Plans are being considered by this company to enter New Orleans via Banks Street and extend the line to Baton Rouge. This 110-mile line will connect New Orleans, Kenner, Hanson City, Harrihan and Shrewsbury. A. S. Bowman, president. [E. R. J., Aug. 16, '13.]

Winnipeg, Selkirk & Lake Winnipeg Railway, Winnipeg, Man.—The Board of Railway Commissioners has passed an order giving this company permission to operate its cars for construction purposes on the line to Stonewall, Man., across the Selkirk branch of the Canadian Pacific Railway. This will enable construction to be proceeded with, and it is reported that track will be laid into Stonewall by Nov. 1. Application has been filed with the board for the construction of a subway, the Canadian Pacific Railway consenting, under the tracks of that railroad at the point where the above crossing has been made.

Muskegon & Manistee Interurban Railway, Muskegon, Mich.—About $150,000 of the $280,000 bonus needed to begin the construction of the proposed 90-mile electric line between Muskegon and Manistee, via North Muskegon, Whitehall, Montague, Shelby, Hart, Pentwater and Ludington, has been pledged. S. M. Weil, 3733 Wilton Avenue, Chicago, Ill., is interested. [E. R. J., Oct. 12, '13.]

St. Joseph Railway, Light & Power Company, St. Joseph, Mo.—It is reported that this company has made arrangements to build an electric line from St. Joseph to De Kalb, Mo., and will operate electric trains from St. Joseph to Atchison and from St. Joseph to Edgerton. Electric lines to Sugar and Bean Lake also are proposed. The company will buy the Rock Island branch from Atchison to Edgerton by way of completing its lines.

***Helena, Mont.**—John D. Ryan, Helena, states that he will contribute $50,000 toward the construction of an electric railway from Helena to the Prickly Pear Valley. The Commercial Club of Helena is also interested in this project, and preliminary arrangements are being made to launch the enterprise.

Fallon (Nev.) Electric Railway.—Grading has been completed by this company on its 18-mile line to connect Fallon, Stillwater and Harrigan. The line to Stillwater is 13 miles to the east of Fallon and the line to Harrigan is 5 miles to the south. Storage battery cars will be used.

Federal Light & Traction Company, New York, N. Y.—It is stated that this company, owner of the Gray's Harbor Railway & Light Company, contemplates the construction of interurban railways in the Gray's Harbor country through Montesano, Cosmopolis, Aberdeen and Hoquiam. It is probable that surveys will be made shortly.

Buffalo & Williamsville Electric Railway, Williamsville, N. Y.—This company has filed a petition with the Public Service Commission requesting permission to abandon its line in Batavia.

Public Service Railway, Newark, N. J.—At a session of the Montclair Heights Community Club it was decided to ask the State Board of Public Utility Commissioners to request this company to build an extension of the Valley Road line from the State Normal School at the Montclair line to Paterson.

Cape Breton Electric Company, Sydney, N. S.—During the coming year this company plans to spend $250,000 in betterments for its lines.

Cleveland, Alliance & Mahoning Valley Railroad, Cleveland, Ohio.—This company has completed its Ravenna-Warren division as far east as Newton Falls and will begin running cars by Nov. 1. A new line is nearly completed east of the junction with the Ravenna-Alliance division to the old Baltimore & Ohio Railroad right-of-way which the company purchased several years ago. Work of completing the line to Warren will be commenced in the spring. [E. R. J., March 22, '13.]

Bartlesville (Okla.) Interurban Railway.—This company has decided to build a 2-mile extension in Bartlesville.

Lake Erie & Northern Railway Brantford, Ont.—At the meeting of the Dominion Board of Railway Commissioners which was recently held in Hamilton this company obtained the right to operate temporarily over the tracks of the Grand Valley Railway, over a recently installed diamond, the latter's prior rights being protected. It also obtained permission to divert the rails of the Grand Valley Railway in North Dumfries, Ont., the work to be done under the supervision of the engineer of the Grand Valley Railway. The company also secured approval of the crossing at grade of the tracks of the Grand Valley Railway near Paris, Ont., but its route was not approved between Brantford and Port Dover. Its engineers will therefore secure options on lands for a different route.

Forest Hill Electric Railway, Toronto, Ont.—This company has asked the government for permission to proceed with the construction of its line in Toronto, and it is expected that work will be begun shortly. This is part of a plan to build a line from the northern limits of the city of Toronto at Dunvegan Road north to Forest Hill, and thence out through Eglinton Avenue and Dufferin Street district in Toronto. [E. R. J., Sept. 13, '13.]

Toronto Suburban Railway, Toronto Junction, Ont.—The Ontario Railway & Municipal Board has issued orders for this company to proceed with its extensions on Pacific Avenue in Toronto.

Portland Railway, Light & Power Company, Portland, Ore.—This company has agreed to build an extension on East Halsey Street and Barr Road from East Thirty-seventh Street to East Eighty-second Street in Portland when $21,000 is raised, the grade crossings eliminated and a guaranty is made that the company will not be required to pave beyond East Sixteenth Street.

Harrisburg (Pa.) Railways.—Material has been purchased by this company to build a connecting link between Rockville and Dauphin, a distance of between 4 and 5 miles.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—This company has awarded a contract to the Swanston Contracting Company, Pittsburgh, to build its line between Beaver and New Castle. It is understood that the company has franchises and right-of-way along the entire line and it is expected that grading will be continued during the winter. The line will cross the Beaver River at a point near Ellwood City on a bridge to be constructed by this company and will extend through Koppel, Homewood and Beaver Falls to Beaver.

North Anderson Street Railway, Anderson, S. C.—This company has completed and will soon place in operation the 1-mile extension of its North Anderson line between Anderson and North Anderson. Under the arrangements with the North Anderson Development Company, the new

line was constructed and will be operated by the Greenville, Spartanburg & Anderson Railway as a part of the regular city line. [E. R. J., Aug. 30, '13.]

***Abbeville, S. C.**—Plans are being considered to build an electric railway between Anderson, Abbeville and Edgefield. Among those interested are C. C. Godman, Fort Smith, Ohio, and C. C. Gambrell, Abbeville.

Chattanooga, Tenn.—A tunnel through Missionary Ridge, near Chattanooga, has been completed by the county at a cost of $250,000. The tunnel is lined with concrete and is wide enough for railway tracks to be laid. It is reported that this tunnel will be used by the East Tennessee Traction Company, which plans to build an electric line from Cleveland to Chattanooga, 30 miles.

Southern Traction Company, Dallas, Tex.—Work has been begun by this company on the extension of the Sanger Avenue line in Waco to Huaco Heights. Arrangements are being made by this company for an extension from Temple and Belton to Austin.

Fort Worth (Tex.) Traction Company—This company has received thirty days in which to consider an extension of the university car line.

Northern Texas Traction Company, Fort Worth, Tex.—Plans are being considered by this company for an extension of the University line in the Tenth Ward in Fort Worth.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—Track-laying has been begun by this company between Salt Lake City and Provo. This 75-mile line will connect Salt Lake City, Provo, American Fork, Pleasant Grove, Springfield, Spanish Fork and Payson. W. C. Orem, Salt Lake City, president. [E. R. J., Aug. 30, '13.]

Utah Light & Railway, Salt Lake City, Utah.—This company has completed the extension of its line between Warm Springs and Centerville, 13 miles. Surveys are still under way for the proposed line between Holliday and Big Cottonwood.

Virginia Terminal Company, Richmond, Va.—A bill has been introduced in the House of Representatives to authorize this company to build an electric railway from the Aqueduct Bridge in Georgetown across Washington to the Union Station, following Thirty-sixth Street, M Street, New Jersey Avenue and Massachusetts Avenue.

Seattle (Wash.) Municipal Railway.—Track work for division "A" of this municipal railway in Seattle has been completed. This means that the cars will be run over the line from its southern terminus at Third Avenue and Pine Street to its northern end at Thirteenth Avenue West and Nickerson Street, a distance of more than 4 miles. [E. R. J., Jan. 25, '13.]

SHOPS AND BUILDINGS

San Diego (Cal.) Electric Railway.—Plans are being made by this company to begin soon the construction of its new carhouse at Adams Avenue and Florida Street in San Diego. The structure will be 200 ft. x 300 ft. and of brick and concrete construction. The building will contain fifteen tracks.

Iowa Railway & Light Company, Cedar Rapids, Ia.—Plans are being made by this company to build a new interurban passenger and freight station in Cedar Rapids.

Clinton (Ia.) Street Railway.—Work has been begun by contractors Miller & Ladehoff for the foundation of this company's new carhouse in Clinton. The structure will be 60 ft. x 140 ft. and one story high.

Davenport-Muscatine Railway, Davenport, Ia.—It is reported that this company has secured an option on property, 60 ft. x 140 ft., on Front Street near Iowa Avenue in Muscatine on which it plans to build a new freight depot in the near future.

Oskaloosa Traction & Light Company, Oskaloosa, Ia.—Alterations and improvements are being made by this company at its offices and station in Oskaloosa.

Louisville (Ky.) Railway.—Work on the new repair shops of this company is progressing rapidly. Two of the buildings are under roof and the third has the steel work in position. The buildings are of brick and steel construction. They are separated from each other. One of the buildings is to be used as a carpenter shop, the second as a paint shop and the third as a machine shop, where repairing and construction work will be done. While there is ample room for the construction of new cars in the new repair shops, it has not been decided that the company will make all of its own cars, though some of them undoubtedly will be built there. The repair shops cover a site 275 ft. x 700 ft.

Kenner-New Orleans Interurban Railway, New Orleans, La.—Plans are being made by this company for new terminals and a new passenger station on Rampart Street between Tulane Avenue and Canal Street in New Orleans.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—This company has awarded a contract to the West Construction Company, Baltimore, for the construction of a new freight house on the property recently acquired by the company on West Pratt Street which adjoins its present Lombard Street Terminal in the city of Baltimore.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Work has been begun by this company remodeling its old carhouse in Trenton. A new roof and new front are being built. The company is laying new tracks from Lalor Street to its paint shops and repair shops in Trenton.

Greenville, Spartanburg & Anderson Railway, Greenville, S. C.—Plans are being made by this company to build warehouses on Wofford Street in Spartanburg. The cost is estimated to be about $40,000.

POWER HOUSES AND SUBSTATIONS

Kenner-New Orleans Interurban Railway, New Orleans, La.—Plans are being prepared by this company to build its new power house in New Orleans.

Norfolk & Bristol Street Railway, Foxboro, Mass.—This company has closed a contract for a new 352-hp Stirling boiler for its power house in Foxboro.

Milford & Uxbridge Street Railway, Milford, Mass.—About Dec. 1 this company plans to install one 300-kw rotary in its substation in Grafton. Within the next few days the company expects to set a 150-hp boiler at its power house in Milford. The company has placed an order with the Westinghouse Company for one 300-kw, 600-volt, three-phase, 60-cycle, 1200-r.p.m., alternating-current, self-starting rotary converter; three 100-kva, 13,200-volt, single-phase, 60-cycle transformers and one switchboard for the control of same.

Cape Breton Electric Company, Sydney, N. S.—This company plans to build a new substation at Reserve Junction and an addition to its machine shops.

Cleveland (Ohio) Railway.—This company has awarded a contract to W. Thompson & Son Company for the erection of the first unit of its new power plant. The contract involves more than $300,000.

Cleveland, Painesville & Eastern Railway, Willoughby, Ohio.—An order for two 500-kw, 600-volt, six-phase, 25-cycle, commutating-pole rotary converters has been placed by this company with the Westinghouse Electric & Manufacturing Company.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—Extensive improvements are being made by this company at its power house in Spartanburg. made by this company at its power house in the city of Spartanburg.

Norfolk & Western Railway, Roanoke, Va.—For use in connection with the electrification of this company's line which has been previously announced, the Westinghouse Electric & Manufacturing Company has received orders for the following power station apparatus: three 9000-kw, 25-cycle, 11,000-volt, 1500-r.p.m., single-phase turbo-alternators with two 150-kw, 250-volt turbo-exciters and one motor-generator exciter of the same rating; one 200-kva, three-phase, 25-cycle, 11,000/400-volt O. I. S. C. transformer; three 1500-kva, single-phase, 25-cycle, 33,000/11,000-volt O. I. S. C. auto-transformers, and six 2500-kva and four 3000-kva auto-transformers of similar characteristics; one 10 per cent reactor for the 11,000-volt feeder circuit and one type TA voltage regulator for the turbo-generators.

Manufactures and Supplies

ROLLING STOCK

Cleveland (Ohio) Railway is preparing plans for fifty new cars.

York (Pa.) Railways is reported to be in the market for several cars.

Utah Light & Railway Company, Salt Lake City, Utah, is reported to be in the market for fifteen cars.

Northwestern Elevated Railroad, Chicago, Ill., is contemplating the purchase of fifty to 100 new cars.

Geneva & Auburn Railway, Seneca Falls, N. Y., is expecting to purchase from one to three new interurban cars.

Youngstown & Southern Railway, Youngstown, Ohio, expects to purchase one or two combination cars of the same type as those in present use.

Ohio Electric Railway, Cincinnati, Ohio, noted in the Electric Railway Journal of Sept. 6, 1913, as having ordered six freight trail cars from the Cincinnati Car Company, has specified the following details for this equipment:

Bolster centers, length, 27 ft. 6 in.	Headlining, No. 18 U. S. Ga. sheet steel
Length of body..36 ft. 10 in.	Roof .....arched
Lenth over vestibule, 38 ft. 6 in.	Underframe..... composite
	Air brakes,
Width of sills.....8 ft. 8 in.	West. Sch. HC-1012
Width over all.....9 ft.	Bumpers.....steel plate
Height, rails to sills, 42⅝ in.	Couplers .....Tomlinson
	Hand brakes.....Tower
Height, sill to trolley base, 9 ft. 4 in.	Trucks.....Standard MCB
	Wheels....33-in rolled steel
Body .....wood	

TRADE NOTES

Standard Roller Bearing Company, Philadelphia, Pa., has been placed in the hands of receivers.

Smiley Company, Edmonton, Alta., has received an order to equip the city of Edmonton with railway gates on practically all of its grade crossings.

Galena-Signal Oil Company, Franklin, Pa., has bought about three acres of land at Clearing, Ill., on which to build steel storage tanks, a concrete and brick warehouse and a power plant.

F. D. Spotswood, Lexington, Ky., is equipping a large number of cars of the Bay State Street Railway with its system of accident prevention, including overhead fixtures and other materials.

Walter E. Harrington, formerly general manager Camden & Suburban Railway, and later with the Lykens Development & Construction Company in Pottsville, Pa., has opened an office as consulting engineer in London. In this work Mr. Harrington is associated with Bruce M. Glasgow under the firm name of Glasgow, Harrington & Company, at 10 Drapers Gardens, Throgmorton Avenue, London, E. C. The firm announces that it is prepared to negotiate for the introduction and financing of any legitimate enterprise approved by its engineers.

Changes in the Ackley Brake & Supply Company.—James Arthur Noble, formerly secretary and treasurer of the Ackley Brake & Supply Company, of 50 Church Street, New York City, has purchased the entire capital stock of this corporation and will continue the business of the company under the same firm name, with himself as president and general manager. The Ackley Brake & Supply Company was established in New York City in the fall of 1910 by Griffin S. Ackley subsequent to his withdrawal as president and general manager of the National Brake Company of Buffalo, N. Y. During the time of Mr. Ackley's presidency the firm has manufactured and sold various electric railway specialties and has also dealt extensively in the sale of geared brakes in various sections of the world. These geared brakes consisted of the Peacock brake and the Ackley adjustable and Ackley no-staff brake, the two latter brakes being the inventions of Griffin S. Ackley. So far as the geared brake business is concerned the Ackley Brake & Supply Company, in association with the Deutsche Ackley Bremsen Company, of Berlin; the Cie Française des Freins Ackley, of Paris, and the British Ackley Brake & Supply Company, of London, has limited itself to a defined territory, consisting of all countries of the world except the United States, Canada, Hawaii and the Philippine Islands. In the field of railway appliances and specialties, the company will continue as sole manufacturer and sales agent within the United States and certain outside territory for the Anger improved automatic brake adjuster. It will continue the sale of various geared brakes throughout its territory and will act as sales agent and manufacturer for the Acme limit stop brake staff, a braking device for lightweight cars. It will also retain its export agency for tool steel gears and pinions and will continue to sell throughout the world the Automatic trolley guard, Monarch refillable fuses and Sjoberg car vestibules and sash springs. It is the intention of the new organization to deal more extensively in various railway supplies within the United States and also to exploit in the near future various braking devices of an advanced nature.

ADVERTISING LITERATURE

McGraw-Hill Book Company, Inc., New York, N. Y., has issued a catalog describing its new books on electrical engineering.

Wagner Electric Manufacturing Company, St. Louis, Mo., has issued a folder describing its transformers, motors and electrical instruments.

Mesta Machine Company, Pittsburgh, Pa., has issued a catalog describing its gas engines for all classes of service and for any kind of fuel gas.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued Bulletin No. 34-T, describing its Class "M" Corliss type steam-driven air compressors.

Goldschmidt Thermit Company, New York, N. Y., has issued a catalog describing rail welding and motor case and truck frame repairing by the Thermit process.

Ohio Brass Company, Mansfield, Ohio, has issued its *O-B Bulletin* for September-October, 1913, which contains leading articles on "Thomas A. Edison" and "Train Operation in City Service."

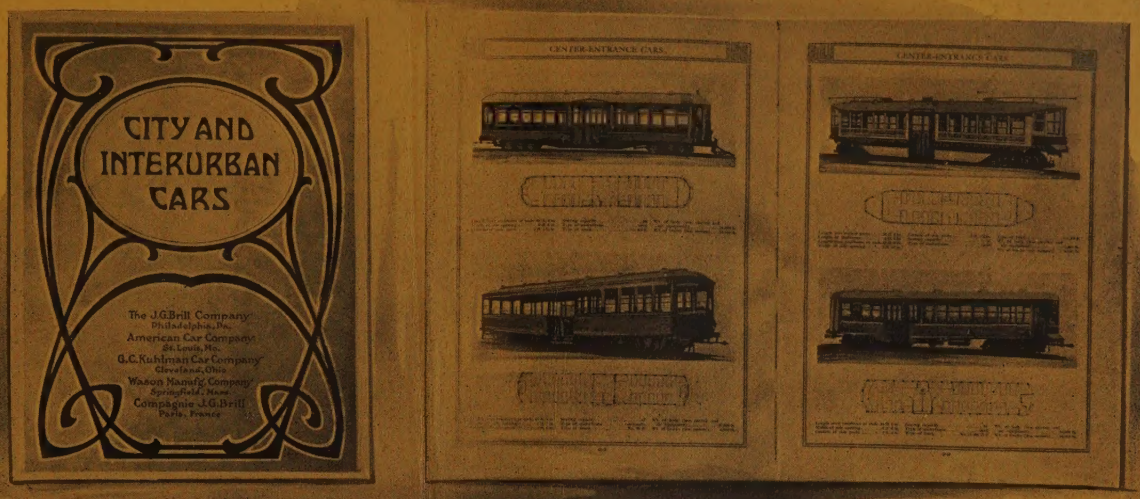
Western Electric Company, New York, N. Y., has issued the *Western Electric News* for October, 1913, which contains a leading article on the distribution and extent of the foreign business of the company.

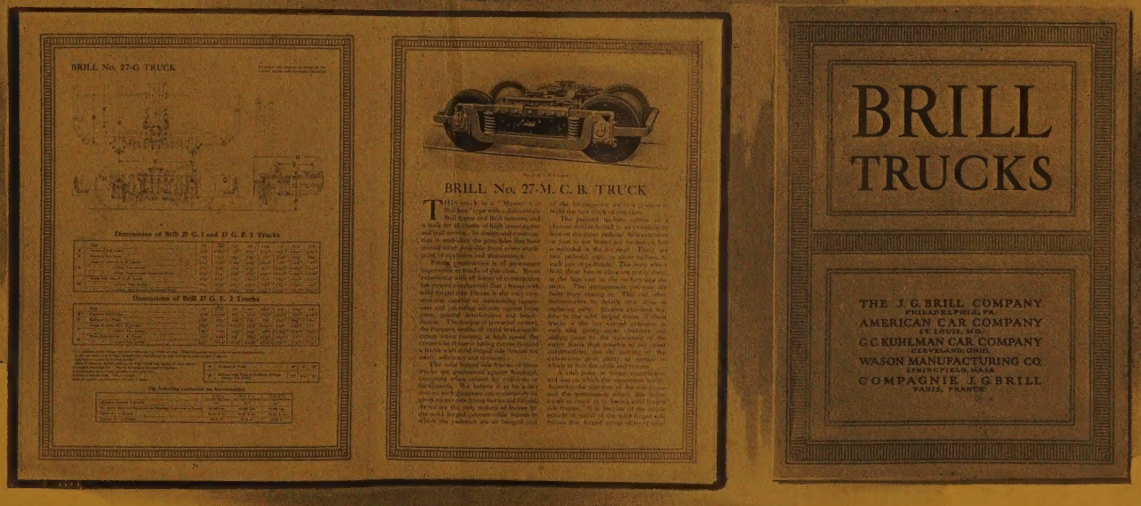
Railway Improvement Company, New York, N. Y., has issued Catalog No. 5 of its series of bulletins containing testimonial letters from electric railways showing the economy resulting from the use of its coasting-time recorders.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a booklet entitled "Joe and His Travels," which contains a series of advertisements portraying the system of the company in having its railway engineers make frequent visits to operating men throughout the country.

Dahlstrom Metallic Door Company, Jamestown, N. Y., has issued an exceptionally complete catalog in nine sections showing many shapes of cold-drawn metal moldings, such as those used for car finishing and in building fireproof partitions and general interior work. The sections are shown in profile and they are cataloged as to sizes, weight per lineal feet and price. One page is devoted to an illustration and description of the details of a fire-proof swtchboard operator's bay for the Waterside generating station of the New York Edison Company.

The J. G. Brill Company, Philadelphia, Pa., prints in the October, 1913, issue of the *Brill Magazine* an illustrated biography of Frederic W. Hild, general manager of the Portland Railway, Light & Power Company, Portland, Ore. Among the feature articles are the following: "Conditions Which Govern the Type of Car for City Service in Syracuse, N. Y.," "Varied Types for Interurban Service in Southern Illinois," "Single-End Pre-payment Cars," "Combination First-Class and Second-Class Cars for Peru," "Severe Test for a Light-Weight Car," "Near-Side Cars for Atlantic City & Shore Railway," "Steel-Frame Cars for Mobile," "Steel Gas-Electric Motor Cars," and "Semi-Convertible Interurban Cars for the Valley Railways."





EVERY buyer of cars and trucks should have copies of these two new catalogs. In its 80 pages, the car catalog shows over 100 types of city and interurban passenger, combination, freight, work and special purpose cars, all built within the last three years and a large proportion within the last year. Every engraving of a closed car is accompanied by a floor plan and general dimensions and weights are given throughout. The truck catalog has 40 pages of complete information on Brill motor trucks. In addition to large engravings and full descriptions, names of parts and dimensions are clearly charted and will be found to cover practically every item of information in each particular. Both catalogs are 9 by 12 inches in size.

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